

THE IRON AGE

THURSDAY, FEBRUARY 16, 1888.

The Simonds Metal Rolling Machine.

The aim at economy and rapidity of manufacture, together with the utmost attainable accuracy of work, has, during the past few years, been responsible for a remarkable degree of mechanical progress. Particularly noticeable, perhaps, has this development been in connection with machin-

of the company and inventor of the machine, and the performance of the plant itself, which embraces 13 of the machines, we were offered an opportunity to witness during a recent visit to Fitchburg.

The engraving on this page will impart a fair idea of the general characteristics of the machine, though for the details our readers must refer to the engravings on

duplicated within and below the frame and floor line, as shown in Fig. 2. Mounted on these standards, by means of suitable fixtures, are a number of rollers, *r*, in the manner illustrated in Figs. 1, 2, 3 and 4, arranged to act as front, rear and side supports and guides to two cast-iron traveling platens, *O O*. They thus take the place of the ordinary sliding surfaces, and,

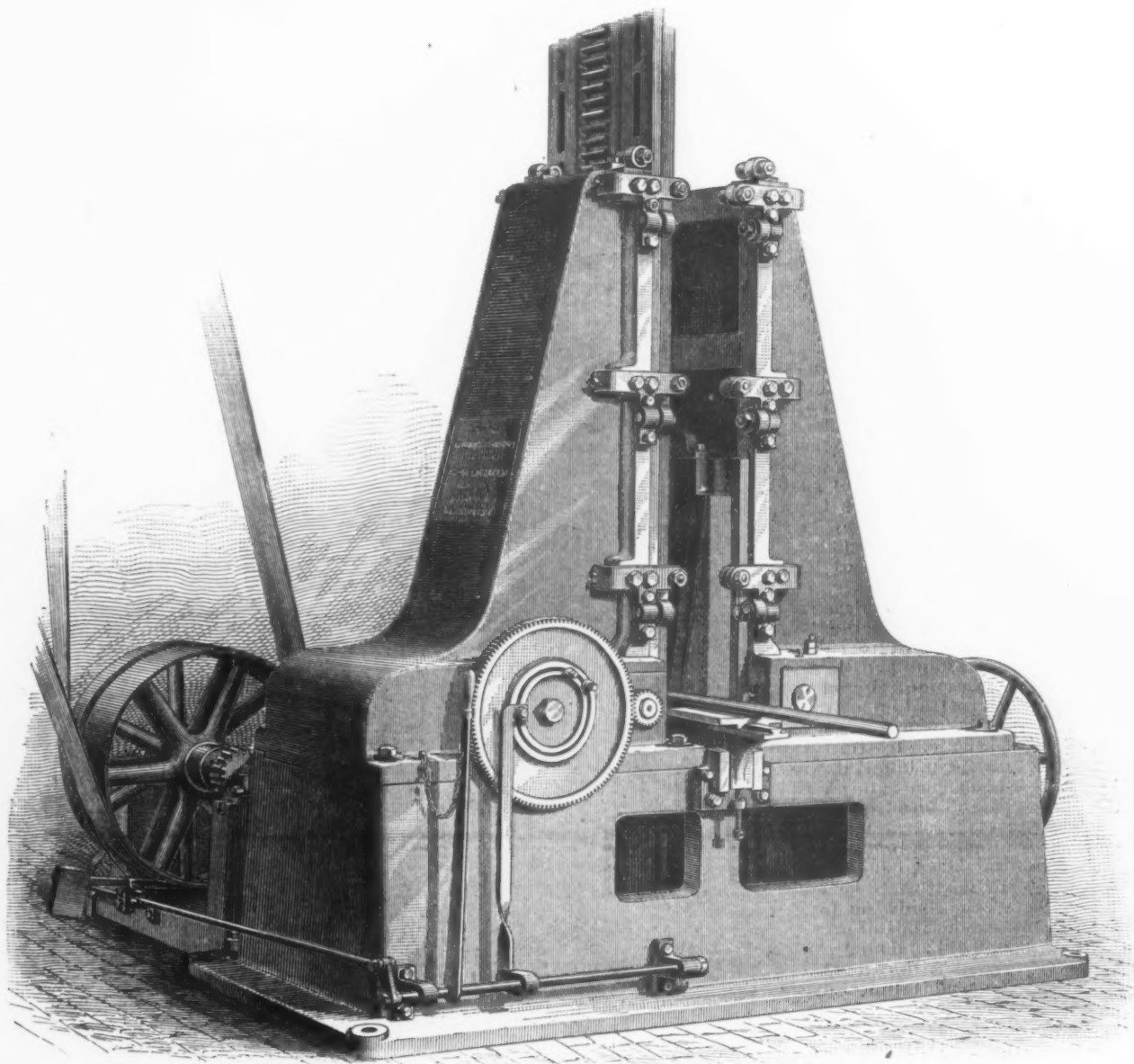


Fig. 1.—General View.

METAL ROLLING MACHINE, BUILT BY THE SIMONDS ROLLING MACHINE COMPANY, FITCHBURG, MASS.

ery for the working of metals, new ideas and new designs having crowded one another in rapid succession. As an example of probably the most recent departure in this line, and one of far-reaching importance, the metal-rolling machines of the Simonds Rolling Machine Company, of Boston, whose works are at Fitchburg, Mass., are of interest, and we take pleasure, therefore, in presenting in this issue engravings which very clearly illustrate the design and manner of working of one of them. The drawings and photographs from which these were made were kindly furnished us by Mr. George F. Simonds, the president

the succeeding pages, representing a plan, and side and end elevations and section, together with different views of one form of die used, and a specimen of work done by the machine. We will here explain at once that the latter is designed, as may already have been inferred, for rolling accurately and in a short space of time a large variety of work which at present is turned out by more laborious and expensive processes, such as lathe turning, the customary methods of forging, and others. The machine, it will be noticed, consists in the main of a substantial bed and two standards, *M M*, which are practically

affording only rolling contact, reduce friction. The reference letters on the platens *O* unfortunately have the appearance of holes, but we trust that this will lead to no misunderstanding. Fitted into the backs of these platens are two racks (see Figs. 1, 3 and 4), gearing with pinions *B*, Fig. 3, in the interior, mounted on the shafts *A A*, and indicated only by dotted lines in Fig. 2. These pinions have power transmitted to them from the driving pulleys *P* and *P'* through a series of gear wheels *a, b, c, d, e, f, g* and *h*, shown in the plan and also indicated in the elevation, Fig. 2. The pulleys *P* and *P'* run in opposite direc-

tions, one of them having an open and the other a crossed belt, and both are mounted loosely on the shaft R, to which is attached the friction clutch pulley Q. From Figs. 2 and 3 it will be readily understood that as the lever F is moved either from

the right or to the left, engaging with the pulley P' or P, as illustrated in Fig. 3, and thus imparting motion in either direction desired to the shaft R and pinion *a*. From the latter the motion is transmitted further, as we have already explained, the

observed in Figs. 2 and 4 that they carry the cast-iron plates N N, into which the dies proper are dovetailed, the section of these for this purpose being as shown in Fig. 5. The die there illustrated is for forging car axles, of one of which a sketch

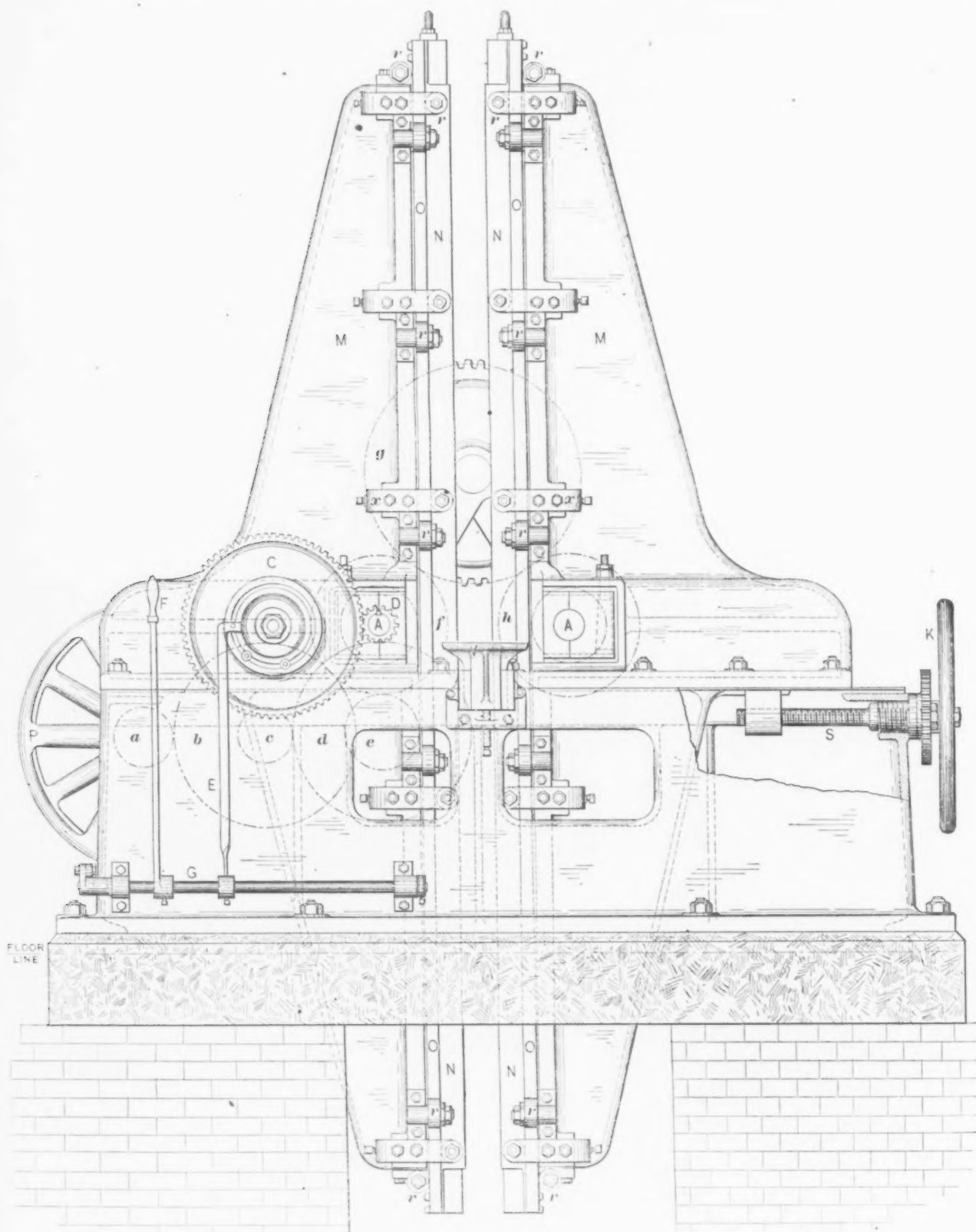


Fig. 2.—Side Elevation.

METAL ROLLING MACHINE, BUILT BY THE SIMONDS ROLLING MACHINE COMPANY, FITCHBURG, MASS.

or toward the machine the shaft G, to which it is fastened by a set-screw, is turned, and by means of the small crank at the left transmits motion to the transverse rod H, and from this to the collar J and pulley Q by a short vertical pivoted lever at the back of the machine. By means of this arrangement the pulley Q can be shifted either to

pinions on the shafts A A in all cases turning in opposite directions, so that one of the platens fitted with the central racks always travels upward while the other travels downward. The gear-wheel *g*, shown in Figs. 3 and 4, is supported by a frame of which the arrangement will be understood from the different engravings.

Returning to the platens, O O, it will be

is also given. From what we have already said it will be understood that the dies are used in pairs, moved in opposite directions over the metal to be shaped, the die surfaces, of course, being exactly alike. The die illustrated affords a good example of the method of construction adopted. From the plane faces of the dies, which lie parallel to each other when in position for

work, rise the forming and reducing and spreading surfaces, the plane portions serving to support and steady the work and prevent it from rocking. The reducing surfaces are grooved or serrated in order to insure a firm grip

the same as the rate of linear movement of the dies. The reducing faces commence to work on the metal at the extreme left where they meet in a point, and when the hot blank is placed between the dies the central reduction of the axle is commenced

cutters *c c*. The edges of these cutter projections are also serrated, so that the rotation of the blank is under control throughout the length of travel of the die. The material operated upon, we need perhaps not specially explain, is compressed and condensed as it assumes the required shape under the dies. The construction and function of all other forms of dies for use in the machine are on the same general basis.

The blank to be operated upon is inserted between the dies, and rests on the supporting plate marked *V* in Figs. 2 and 4, one of the dies being at or near the end of its up stroke, and the other at or near the end of its down stroke, so that the extreme ends of the gripping surfaces of the dies are opposite each other in a line passing through the centers of the shafts *A A*. The rest *V* is adjustable vertically, and its position is dependent upon the size of the blank, being such that the center line of the blank is also in the same horizontal plane with the center line of the shafts *A A*. The friction pulley *Q* (Figs. 3 and 4) being then thrown into gear with either pulley *P* or *P'*, as the case may require, by the means already described, causes one of the die platens to travel up and the other down, until the extremities of the cutting-off edges *c c* (Fig. 5) are opposite each other, when a finished car axle, or whatever other product the dies may have been designed for, is the result. The whole operation occupies only the fraction of a minute, a fact strikingly suggestive of the rapidity with which work can be turned out. The

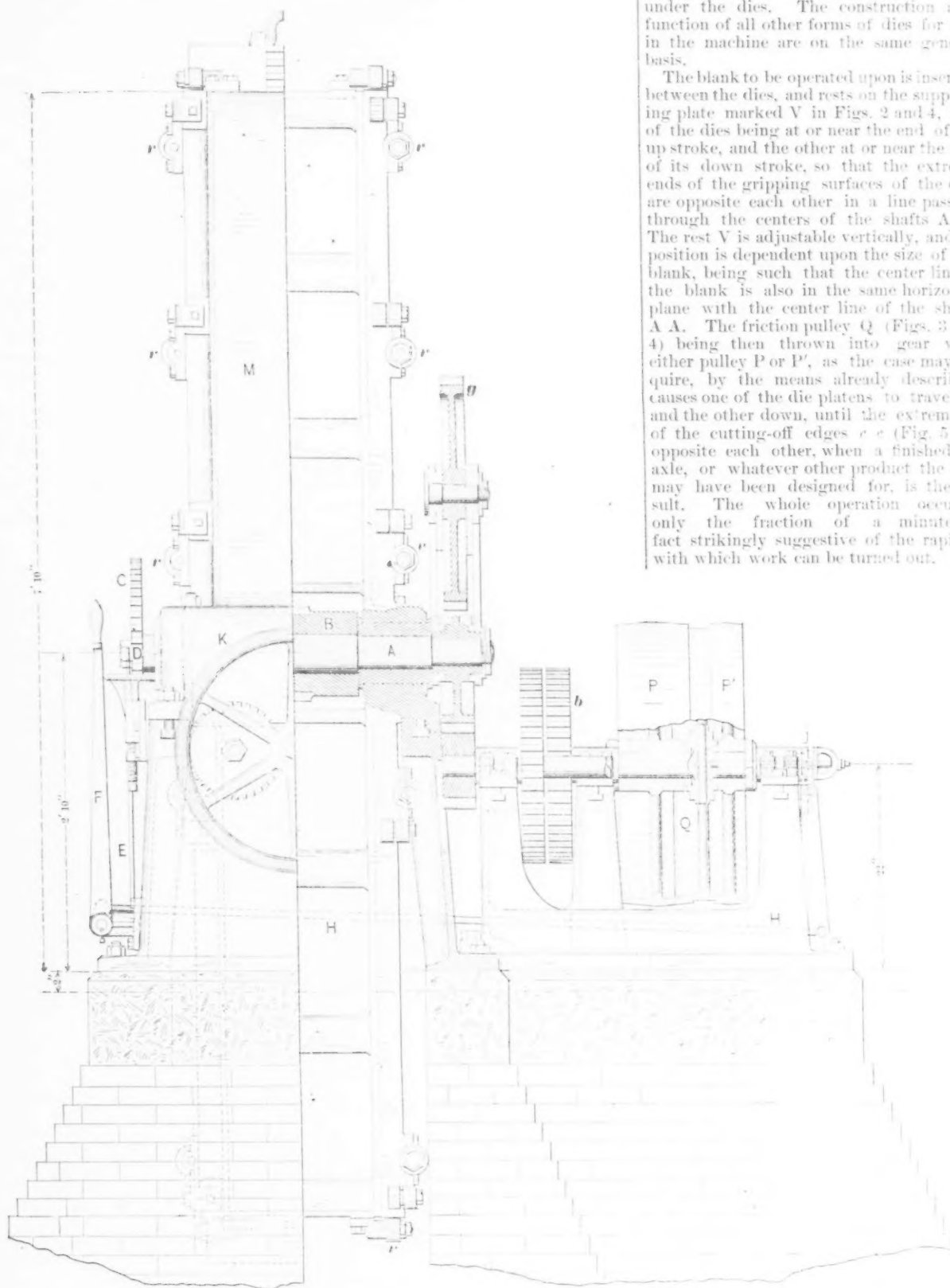


Fig. 3.—End View and Vertical Section.

METAL ROLLING MACHINE, BUILT BY THE SIMONDS ROLLING MACHINE COMPANY, FITCHBURG, MASS.

on the hot and plastic metal and perfect regularity in its rotation, and being thus arranged obliquely, the marks made in the metal by the serrations are obliterated in subsequent revolutions of the blank, and the rate of the surface movement of the latter, where work is being performed, is

by the narrow end of the tapering raised portion *a* of the die face. It will be noticed from the cross-section of the die that, in general configuration, the raised portions are like the half-section of the axle, the shearing off squarely of the ends of the axle being accomplished by the bevel edge

smaller the article made the greater may of course be the speed of working, boot calks for lumbermen, for example, now being turned out at the works of the Simonds Rolling Machine Company at the rate of from 10,000 to 20,000 per day. For different sizes of stock the distance be-

tween the die faces can be adjusted by means of the hand-wheel K (Figs. 2 and 3), carrying on its shaft a small spur-wheel which gears with two larger spur-wheels, as shown in Fig. 4. These wheels in turn are attached to two screws, S, Fig. 2, by means of which the right-hand standard M, with its lower extension, can be moved either nearer to or further away from the standard at the left, which is immovable. By means of a pointer and suitable graduations for the hand-wheel K the distance between the die faces may be adjusted to within small fractions of an inch. The desired adjustment having been made, the standard is rigidly clamped to the frame

is provided with a circular T-slot, in which two stops can be clamped at any desired points. In this slot also is a loose pin fitted to the upper end of the lever E, which is secured to the shaft G operating the mechanism of the friction pulley Q, by an intermediate crank. The wheel C obviously can revolve without affecting the position of the rod E in any way until the upper horizontal projection of the latter is struck by either one of the stops mentioned. This being the case, the lever is either raised or depressed according to the direction of revolution of the wheel C given to it by the wheel D, the rod G is turned in either one direction or

simple and substantial design, and accomplishes its object in a thoroughly satisfactory manner. The lines of work to which it may be successfully applied are practically unlimited, and since the plant at Fitchburg was first started Mr. Simonds has demonstrated its practical value for a large number of interesting purposes. One of these, as we have incidentally pointed out in our description, is the rolling of steel car axles. In addition, full size carriage axles, conical projectiles, spindles, and also spheres for ball bearings are produced with great rapidity. Another production is that of steel calks for lumbermen's boots, the work thus ranging from that of appreciable proportions to articles of comparatively very small size. Perhaps the most remarkable work the machine does is the rolling of bolts and screws of endless variety. The economy of manufacture is for obvious reasons very great, and the quality of the work is beyond reproach. The works at Fitchburg are mainly of an experimental character, and the design of the company, as we understand it, is to establish works for special lines of manufacture throughout the United States. At present all indications point to the building up of an industry of great extent and general interest to iron and steel workers. An English company, known as the Simonds Steel and Iron Forging Company, Limited, have been formed in London, with a capital of £150,000. We would remark here also that one of the features of the programme

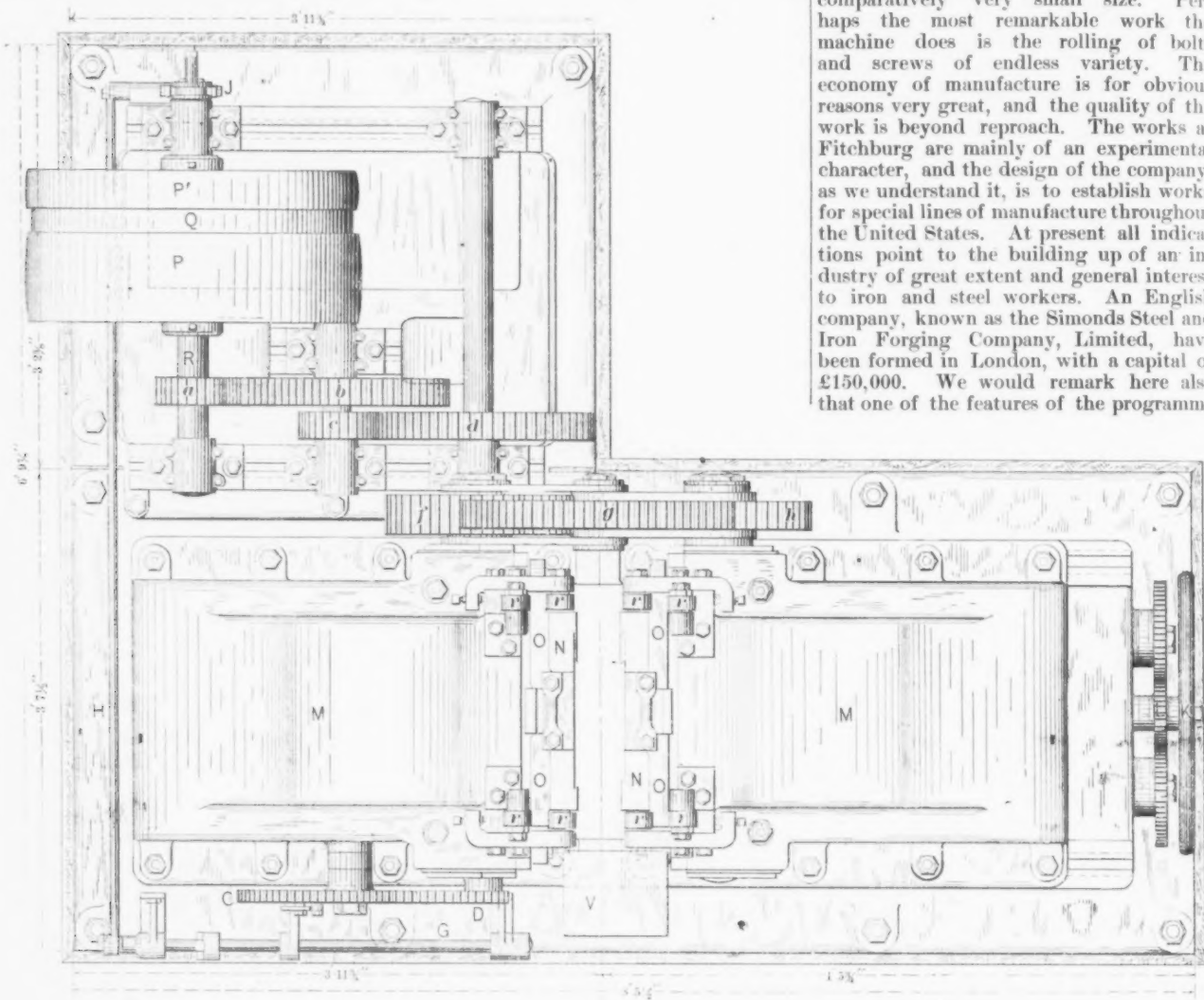


Fig. 4.—Plan.

METAL ROLLING MACHINE, BUILT BY THE SIMONDS ROLLING MACHINE COMPANY, FITCHBURG, MASS.

of the machine by the bolts passing through the side flanges. The die platens, after having performed the strokes just considered, are brought back to their initial positions by reversing the motion, the pulley Q being thrown into gear with the belt pulley, which during that time has been running loosely on the shaft R, Fig. 4. A careful study of the engravings will explain our meaning more clearly. The machine is then ready to repeat the operation just described. It will be noted that the reversal of motion, as we have thus far described it, is accomplished by means of the lever F, within easy reach of the attendant. The machine may, however, be made to accomplish this automatically by means of the two gear wheels C and D, shown in Fig. 2, the latter wheel being fast on one of the driving pinion shafts A. The body of the wheel C, with which it meshes and which is driven by it,

the other, and, through its attachments, disengages the clutch pulley Q from the pulley P and throws it into gear with the pulley P', or *vice versa*, in either case reversing the motion of the shaft R and of the die platens O O. The length of stroke traveled through by these before reversal is thus effected depends, as we have explained, upon the positions which the stops occupy in the gear wheel C, and which can be varied at will.

The die platens and dies have rings attached to their upper ends, into which the hooks of a hoisting tackle may be passed for convenient removal when a change is desired. The pulley Q, as shown in the perspective view on the first page, is furnished with a brake-band, held taut by a weighted lever. This arrangement has been found desirable to check the momentum of the moving parts.

The machine, as a whole, is of very

for the Boston meeting next week of the American Institute of Mining Engineers will be a visit to Mr. Simonds's works. Those who will attend will have reason to congratulate themselves on having witnessed an exceedingly interesting and valuable exhibition.

The owners of the Inman and Red Star line of steamships are endeavoring to have the Dry Dock at the Brooklyn Navy Yard extended to 600 feet, there being in the country at present no dock large enough to receive their 9000-ton steamers, now building, in case they should need repairs.

The Baltimore *Manufacturers' Record*, which has been so prominent and so successful in aiding the industrial development of the South, has just entered upon its thirteenth volume.

Electrolytically Formed Copper Pipes.

The recent accident to the steam pipe of the British steamship Elbe lends a special interest to an electrolytic process for the manufacture of copper now being practiced by Mr. W. Elmore, at Cockermouth, England. According to this method, described in *Engineering*, such an article as a steam pipe can be produced without weld or joint, and having a tensile strength from 50 to 100 per cent. in excess of first-class brazed pipes. Further, this result can be attained with the use of a very inferior quality of copper, and at a cost which will enable the electrolytically made article to compete in the market with the customary varieties. Of course there is nothing new in depositing copper in a tubular form, but hitherto such metal has been too brittle to render it liable for use in circumstances under which it is exposed to great stress. For copying engraved plates, and for the rollers of calico printing machines, depos-

and can be drawn, bent or compressed without annealing and without any tendency to crack. Specimens polished and submitted to the microscope show that the electrolytic metal has a perfectly compact and homogenous structure, while drawn copper is a honeycombed mass of crystals, only connected together at points. The success which has attended the experimental stage of Mr. Elmore's process encourages the belief that absolute security from burst copper steam pipes can be secured in the future, and that we are on the eve of being supplied with a greatly improved quality of copper for all purposes.

Brick and Stone Bridges of Large Span.

According to Professor E. Dietrich, of Berlin, there are only 57 bridges of brick or stone existing having a span greater than 131 feet. Forty of these have spans lying between 131 feet and 164 feet, 10

In all the railway bridges this ratio lies between one-twentieth and one-thirtieth, the smaller fraction being solely confined to road bridges. Twenty-seven of the bridges are situated in France, thirteen in Italy, ten in England, two in Austria, two in Spain and one each in Germany, Switzerland and the United States.

A Model of an Earthquake.

In the latest part of the *Journal of the Science College of the University of Tokio* Professor Sekiya describes a very curious and remarkable model he has made to exhibit the manner in which a point on the earth's surface moves during an earthquake. Those who have followed the recent progress of seismometry in Japan are aware that the motion which is recorded at an earthquake observatory is a prolonged series of twists and wriggles of the most complicated kind, so that the path pursued by a point on the surface of the soil has been aptly compared to the form taken

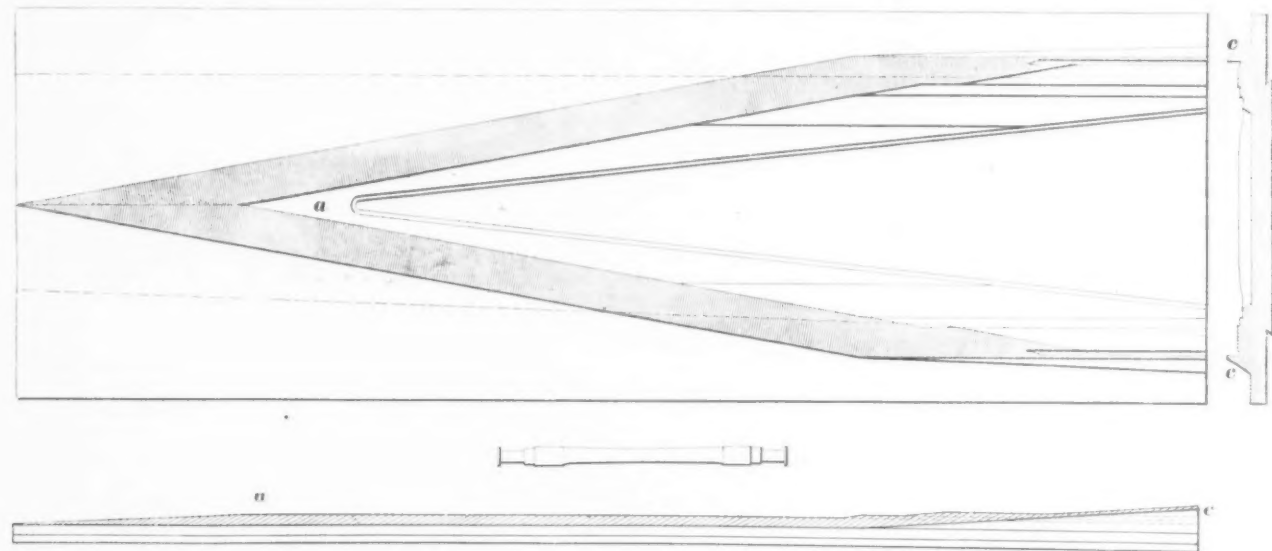


Fig. 5.—Plan, Elevation and Cross Section of a Die for a Car Axle, with Specimen of Work.

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ited copper has been used with great success, and when it has been thrown down very slowly it has been possible to produce very satisfactory qualities of metal for these purposes. The novelty introduced by Mr. Elmore, however, lies in breaking down the crystals almost immediately they are formed, and pressing them out into a fibrous form in which they are interlaced and matted together. To this end the iron core or mandrel on which the metal is deposited is kept constantly rotating in the bath, and an agate burnisher is slowly moved backward and forward lengthwise of the cylinder as if to cut a screw thread upon it. The speeds are so arranged that a layer of copper $\frac{7}{1000}$ inch thick is deposited between each reciprocation of the burnisher. When the required thickness has been attained the mandrel is lifted out of the bath and placed in a vessel supplied with superheated steam. In a few moments the expansion of the copper detaches it from the iron, and the shell can be stripped off. Pieces cut from such tubes have been submitted to breaking tests by Messrs. Kirkaldy & Co., Professor Kennedy and Professor Unwin, and have broken at strains varying from 27 tons to 41 tons per square inch, with an extension varying from 5 per cent. to $7\frac{1}{2}$ per cent. in a length of 10 inches. The metal can be worked under the hammer most easily,

have spans of from 164 feet and 200 feet, three of from 200 feet to 230 feet, and one only, the Cabin John Bridge, near Washington, exceeds this limit, and has a span of 237 feet. Thirty of these are road and 22 are railway bridges; one carries a canal, another a conduit, and three are not classified. Fourteen of them date from before the commencement of the present century, 22 were built between the years 1800 and 1860, five between 1860 and 1870, six between 1870 and 1880, and since then 10 have been erected. In 22 of the bridges the rise lies between one-half and one-third of the span, in 18 between one-third and one-fourth the span, in 10 between one-fourth and one-fifth the span, and in six between one-fifth and one-eighth the span. One bridge only, a road bridge in Turin, has a flatter arch than given by the smallest of the above ratios, and in this case the rise is $\frac{1}{8.18}$ the span. The radius at the crown lies in fifteen cases between 66 feet and 98 feet; in eight, between 98 feet and 131 feet; in eleven, between 131 feet and 164 feet, and in three cases, between 164 feet and 187 feet $8\frac{1}{2}$ inches, the latter being the radius at the crown of the Devil's Bridge, at Bevizzo, Italy. The ratio of the arch at the crown to its radius at the same point is in thirty bridges between one-tenth and one-twentieth; in ten, between one-twentieth and one-thirtieth, and in eight, between one-thirtieth and one-thirty-fifth.

by a long hank of string when loosely raveled together and thrown down in a confused heap. Professor Sekiya has taken advantage of a very complete earthquake record obtained by him with a set of Professor Ewing's seismographs to follow out this path step by step, and to represent it in a permanent form by means of stiff copper wire. The earthquake he has modeled in this way took place on January 15, 1887, and was unusually severe for Japan. The model, of which we have seen an engraving, represents the absolute motion of the ground magnified 50 times, and shows at a glance the real character and enormous complexity of earthquake motion.

We are indebted to Mr. William Paulsen, Eastern agent of the Collinsville Zinc Works, of Collinsville, Ill., for the following analyses of the spelter made by that concern:

	I.	II.
Zinc.....	99.5698	99.5531
Lead.....	0.4190	0.5385
Iron.....	0.0112	0.0084

The samples were from the ordinary Collinsville spelter.

The Peru zinc mine, at Galena, Ill., one of the most extensive mines of the kind in the West, which was closed a year ago on account of the low price of zinc ore, is to be operated again.

The Hargreaves Hot-Air Engine.

English papers have during the past few weeks given considerable prominence to what appears to be a somewhat remarkable engine designed by Mr. James Hargreaves and built by Messrs. Adair & Co., of Liverpool. The engine, or thermo-motor, as it has been termed, is of the direct combustion type, and during practical test has developed, we are told, an unparalleled degree of efficiency. To the *London Engineer*, in which illustrations of the motor have been published, we are indebted for the following particulars concerning it:

At 100 revolutions per minute it indicates 40 horse-power, and consumes 2 gallons of coal tar per hour, or about 20.5 pounds, or 0.512 pound per indicated horse-power per hour, the cost of 2 gallons of coal tar being less than 3d. If we now examine the principle of the engine we shall see how this extremely low consumption of fuel is attained. In 1824 Sadi Carnot propounded the great principle that the efficiency of any heat engine depended on the difference between the highest and the lowest limit of temperature in the working fluid, and that this difference must be as great as possible in order to secure a high efficiency. In the Hargreaves engine the highest temperature is probably over 2461° absolute, and the lowest 661° absolute, or 2000° , and 200° F. $2461-661$

on the ordinary scale, giving $\frac{2461}{830} = 0.73$ as the highest theoretical available efficiency of the working fluid. If we compare this with a steam engine working with a boiler pressure of 170 pounds absolute, and a terminal pressure of 6 pounds absolute, we have 830° and 631° as the highest and lowest absolute temperature, $830-631$

giving $\frac{830}{2461} = 0.24$ as the highest theoretical efficiency of the working fluid in the cylinders. The efficiency of the boiler not being more than 0.7, we have $0.24 \times 0.7 = 0.168$ as the theoretical efficiency of the whole machine. In practice the Hargreaves engine burns 0.512 pounds of coal tar per indicated horse-power, and this may be still further reduced, while there are few steam engines even of large size which burn less than 1.6 pounds of coal per indicated horse-power per hour. As shown in the published engravings, the engine is not very complicated though there are a number of attachments in the shape of air and fuel pumps, a small steam boiler for working one of these, regenerators, &c.

The steamer *Puritan*, building at Chester, Pa., for the Fall River Line will be the largest vessel of her class afloat. She will cost \$1,500,000, and is now two-thirds finished. Her hull is of steel, unsinkable and fireproof. The principal dimensions are as follows: Length over all, 420 feet; length on the water line, 404 feet; extreme beam, 52 feet; extreme breadth over guards, 91 feet; depth of hull midships, 20 feet 6 inches; height of dome from floor, 63 feet; draft of water, 12 feet; estimated tonnage (gross), 4650; estimated displacement in tons, 4200; weight of engine, boilers, &c., in tons, 1400. Her bottom is cellular and divided into 56 water-tight compartments. The engines and boilers will all be inclosed by watertight and fireproof compartments. She will be propelled by a vertical beam engine of the compound type. The *Puritan's* low-pressure cylinder will be 110 inches in diameter, and the piston stroke 14 feet. The high-pressure cylinder will be 75 inches in diameter, with a piston stroke of 9 feet. Steam will be furnished from eight steel boilers of the Redfield return tubular type, and the maximum working pressure will be 110 pounds to

the square inch. The indicated horse-power of this enormous engine is estimated at 7500. The engine will drive a pair of feathering paddle-wheels at the rate of 24 revolutions a minute. They will be 35 feet in diameter. The vessel will be steered by steam, and is expected to have a speed of 21 miles an hour.

Drawing Wire.

Usually patent specifications are dry reading and they rarely review the considerations which led the inventor to seek improvement of methods or appliances in a fresh direction. An exception to this rule is furnished by the admirable specification of patent recently granted to James Withington, of Chambersburg, Pa., assignor to the Trenton Iron Company, of Trenton, N. J. It is practically a critical description of modern methods of wire drawing, with their limitations and drawbacks. We quote the following from the document in question:

A billet of highly heated iron or steel is first successively reduced through the gradually lessening passages of any suitable rolling mill until it emerges from the last pass as what is known as a "wire rod," the usual diameter of which is a little less than $\frac{1}{4}$ inch. These wire rods are immediately and while hot wound upon reels into coils. These coiled rods, after cooling, are next immersed in tubs containing acid, preferably dilute sulphuric or muriatic to remove the scale or oxide—sulphuric acid permeating the coat of scale, loosening it by attacking the iron itself and combining with it to form sulphate of iron or green copperas (or if muriatic acid is used chloride of iron), which dissolves out and is held in solution until the liquid becomes so impregnated as to cause further additions of acid to lose their effect upon the rods, when the liquid is run off and replaced by fresh water and acid. When the scale has been sufficiently loosened by the acid the rods are taken out of the tubs and either suddenly immersed in a tub of clear water or else subjected to a stream from a hose (the more thorough as well as the more expensive method), in order that by washing all traces of scale and acid adhering to the surface may be removed. Immediately after washing the rods are immersed in a bath of milk of lime or other suitable coating material and quickly dried, whereby a white coat is imparted to the rods which preserves them from rust. In some instances the lime is omitted, but this occurs only when the rods are to be tinned, coppered, or galvanized, or drawn down into qualities of wire which do not require a bright finish. After coating with lime the wires are drawn or reduced in diameter by pulling through a series of holes or dies in plates of cast steel or cast iron especially adapted for the purpose, the holes or dies being lubricated by any kind of grease, such, for instance, as tallow. This method of drawing wire through greased dies is technically known as "the dry method," and its object is not only to reduce the diameter of the wire, but also to efface the pits or marks caused by the eating of the acid, and render the wire perfectly smooth upon its surface.

Repeated operations of drawing, each time to a smaller size, harden or stiffen the wire, making it more and more elastic, until a point is reached when further drawing would cause the wire to become quite brittle. In drawing down to the finer sizes, therefore, it becomes essential to soften the wire at certain sizes before it can be further drawn down. This is done by annealing or heating to redness in suitable vessels, the temperature depending upon the size of the wire, the larger sizes requiring the greatest heat. At predetermined stages of the drawing processes,

therefore, or after the wires have been reduced to predetermined sizes, annealing must be resorted to, and subsequent to each annealing the operation of cleaning, washing and lime-coating above described must be repeated. The sizes at which annealing is resorted to vary with different manufacturers and with the character of wire desired. The sizes known as Nos. 6, 9, 12, 15 and 18 are the sizes at which annealing is best resorted to.

After the wire has been reduced by the dry method to a size known as No. 18 it is impossible to proceed further with the method of dry drawing, for the reason that such method in the finer sizes does not, by reason of the grease and lime employed, meet the requirements necessary to produce a sufficiently smooth and bright surface, and what is known as "the wet method" must be resorted to for the making of wire of smaller sizes than No. 18.

The wet method of drawing, briefly stated, consists in first immersing wire—after it has been reduced to the smallest size practicable by the dry method of drawing, and after it has been in connection with the dry method of drawing annealed for the last time and thoroughly cleaned by pickling—in a weak, farinaceous, glutinous or mucilaginous solution, such, for instance, as fermented rye flour, which forms upon its surface a mucilaginous film known among wire drawers as the "lees coat;" in then subjecting the wire with the lees coat upon it to the operation of being drawn down through a die, and in finally repeating the coating or immersion and the drawing down with a series of successively smaller dies. By this method only has it been possible heretofore to draw iron or steel wire bright and perfectly clean. It has been inexpedient heretofore, however, to adopt the above method for the larger sizes of wire, by reason of the fact that, even after annealing in the cast-iron pots heretofore alone employed in connection with the said wet drawing process, the wire, even when introduced in a clean and bright condition, has been taken out covered with scale and a dirty yellow or blue or dull black color, and this because of the gas generated in the pot notwithstanding the most complete exclusion of air possible. For this cause thorough cleaning in acid became necessary, after the cleansing off of which immersion in water became also necessary instead of coating with lime, for the reason that the lime, being coarse, when mixed with the lees solution would cut out the dies and scratch the wire. All of these steps necessitate more skillful labor and a more expensive plant, and therefore increase the cost of the larger products over and above their cost by the dry process.

It is proper to remark that in some instances, as in the case of harvester and broom wire, which are completely finished at the size No. 20, the change from the dry to the wet method of drawing is effected at size No. 15. Whatever, however, be the size at which the wire is for the last time annealed before being finished by the wet method of drawing, it is after the final annealing cleaned thoroughly by immersion, bathing, or washing in acidulated liquor, and is then thrown into a bath of clear water until it is ready to be drawn. The office of keeping the wire in water—which must in the first place be perfectly free from acids or salts—is to prevent the rusting which would occur if the wire was exposed to the air for any length of time while wet from its immersion in acidulated liquor, and also to dissolve out any traces of acidulated liquor that may remain in the wire. The water in the wet method, therefore, subserves the same purpose that the lime coat does in the dry method. In the fine sizes of wire, however, the strands lie so closely together

in the hank that the operation of cleaning in acidulated liquor becomes a very laborious one, and it becomes necessary in order to remove the adhering particles of scale, after the coil or hank has been removed from the acidulated liquor, to loosen the fastenings of the coil, spread out its strands, and resort to what is known as "batting," a most lengthy and laborious operation. It is impracticable, therefore, to clean sizes finer than No. 18, so that it is absolutely necessary in the drawing down on these sizes that the surface of the wire should be kept perfectly clean and smooth. This condition also compels the operation of annealing of the sizes below No. 18 to be dispensed with, excepting, of course, such annealing as is resorted to with small wire which has broken or "fallen out" in the drawing before reaching its intended ultimate diameter, and which fits it to be sold as annealed fine wire, a product frequently disposed of below cost, because the "falling out" frequently happens at sizes for which there is no demand.

After the wire has been properly cleaned upon its final reduction by the dry method at No. 15 or No. 18, as the case may be, and when it is not essential that the ultimate product should be silver or liquor bright, as it is termed, the wire, before being subjected to the wet drawing process, is lacquered or dipped for a few seconds in a weak solution of a salt of copper—such, for instance, as the sulphate of copper, which deposits a film of metallic copper on its surface that serves not only to protect its surface from rust, but also to assist the lees-coat in lubricating the dies through which the wire is subsequently drawn. The lacquered wire is next immersed in a tub of lees, from which it is continuously drawn, according to the wet method, through a die. This operation of immersing in lees and drawing through a die is repeated through a series of dies each smaller than its predecessor until the final reduction is attained. The lacquering may also, in connection with the above operations, be either occasionally repeated, or may, if desired, be repeated before each drawing—provided, however, as already stated, a silver or liquor bright finish be not desired—for the reason that while the lacquer greatly assists the lubrication of the dies and is therefore advantageously employed, it yet, when once applied, adheres so closely to the wire that it affects its ultimate tint and, while not affecting its brightness, imparts to it a distinct reddish cast.

Throughout the entire conduct of the above wet drawing or reducing process, it has, for reasons already fully stated, been impracticable to anneal the wire; and the result has therefore been that, although the percentage of each reduction has been comparatively small, yet the tensile strain, on the gradually stiffening very fine sizes (from No. 26 to No. 36) has been so great that only the very best material endures to the ultimate reduction, and much even of the very best material in the best practice "falls out," as it is technically called, or breaks in the drawing before reaching the ultimate size. This wire has heretofore, therefore, been annealed and disposed of at a sacrifice. Of course if it were practicable to clean fine wire this difficulty would be avoided, but it is obvious that between the oxidation in the operation of annealing and the consumption of iron by the acid in the operation of cleaning, to say nothing of the excessive labor in batting, there would not be sufficient substance of wire left to pay for the cost of drawing.

Having now described the usual operations of manufacturing the various sizes of wire, it is proper for me to add that heretofore for many years it has been a desideratum with manufacturers of wire to anneal in such a manner that after the annealing process the wire could be im-

mediately drawn without being first subjected to the laborious and expensive operation of cleaning, or pickling. Two serious conditions or obstacles, however, have heretofore existed to prevent—viz.: the formation of scale upon the metal and the deposit of soot. The formation of scale results from the oxidation occurring when the wire is heated to redness in contact with air. The film of soot is produced by the carbonization of grease existing upon all bright wires drawn by the dry method, and more especially upon the larger sizes. Many experiments to prevent the formation of the light scale of iron oxide have been made, such, for instance as the construction of pots which when charged with wire would leave but a minimum air space, such space being filled with sand, roll scale, mineral wool, asbestos, and various refractory substances, the result of which has been to decrease to an appreciable extent the oxidation, but yet not to such an extent as to enable the operation of cleaning to be altogether dispensed with or to permit of a commercial adoption to any great extent. The film of soot is even more difficult to remove than the scale, as it is unaffected by acids, and must, especially on the finer sizes of wires, be manually removed by washing with water and by the operation of batting. It is by reason of the formation of scale and deposit of soot also that the dry method of drawing wire is inapplicable for the finer sizes, which are therefore drawn by the wet method.

Mr. Withington describes his own method as follows:

I first take the rod which has been rolled from the billet, and pickle and cleanse it in the manner hereinbefore described. I then coat the cleansed product by means of a farinaceous, glutinous or mucilaginous solution, such, for instance, as a weak solution of rye flour, and such as is known as a "lees" solution, and draw the coated product through a die, not only to reduce its diameter, but also to smooth its surface and efface the acid pits. If the ultimate product is not to be silver or liquid bright, but simply bright, I preferably not only at this stage, but subsequently from time to time as the lacquer wears off, to resort to lacquering in connection with the lees coating. The lacquering, however, is not essential. I then repeat the coating and drawing through a smaller die as frequently as may be necessary or desirable, and until the wire requires to be annealed. I then seal the wire in its thoroughly cleansed condition, and in such sufficient quantity to as nearly as possible fill the pot, in tight pots or vessels of sheet or tank metal, boiler or armor plate, being preferably wrought iron, although they may be of steel, and subject the wire so contained or inclosed to the action of heat in order to anneal it. When the process of annealing is completed and the pots and contents have cooled, I then remove the annealed wire from the vessel in which it has been annealed, and find that said wire is clean and as bright as it was before being annealed. I then again subject the clean and bright annealed wire to the lees solution (either with or without lacquering) in order to coat it, and draw the clean coated product through a die and subsequently repeat both the immersion in a "lees" solution and the drawing through a die as frequently as may be desired.

In connection with the above wet-coating and drawing down, the operation, above described, of annealing in wrought iron or steel is usually to be repeated three or four times before the size No. 18 is reached, and at no stage of the operation is pickling, inseparable from the dry drawing process, necessary. After the last annealing in wrought iron resorted to at or before size No. 18, and when a very small size of bright annealed wire, known as "stone

wire," is the product had in view, the wire is subjected to repeated lees coatings (and, if the silver or liquor bright finish be not desired, lacquerings) and to repeated drawings. With the very best stock the above operation—such is the virtue of annealing a clean product in wrought iron—is possible without other annealings than such as are resorted to before the size No. 18 is reached, but with some material, which a skilled workman will readily recognize, it becomes necessary to repeat the operation of annealing in wrought iron once, and in exceptional cases several times, between the size No. 18 and the ultimate size; this annealing is, however, readily performed without any process of cleaning, for the reason that the wire being clean and bright when it is put in the annealing vessel comes out of it clean and bright.

It is manifest that the wet method of drawing, or drawing by the aid of a "lees" coat, is the only one applicable in this process, as it is essential that the wire when put in the annealing pot should be perfectly clean in order that it may be taken out in the same condition, and as it is impossible either to draw wire after the method of dry drawing with grease, the surface of which is in the slightest degree coated with scale, soot or dirt, without soon cutting out the dies, or to anneal it bright even in wrought iron without first subjecting it to thorough cleansing.

The wrought iron annealing pots which I employ in connection with the above process, having been filled with wire, are in the practice of that process placed in an annealing furnace preferably provided with a cast iron receptacle or chamber adapted to receive them, and to prevent their coming into direct contact with the flames of the fires. After being heated to the required temperature they are taken out and allowed to become perfectly cold before they are opened and the wire removed and subjected to the subsequent drawings.

By the above method of annealing bright in wrought-iron pots, and in connection therewith of drawing the bright annealed wires when coated with the "lees" coat through dies, I am enabled to entirely dispense with all the operations of cleaning except the first cleaning of the rod, and also to dispense with the hitherto objectionable method of dry drawing by the aid of grease, and to employ the wet or "lees" coat drawing with the sizes above, as well as with those below No. 18. I am also able, when it becomes necessary to anneal below size No. 18, to anneal bright and, without cleaning, by the aid of the "lees" coat draw to any degree of fineness the sizes under the said No. 18, and to thus certainly, even with poor stock, produce those sizes which have hitherto been difficult to manufacture because the wire drawn down to make them has frequently hitherto broken or fallen out before reaching the said ultimate sizes, and I produce moreover a softer and superior quality of wire than that heretofore made and which has not required such annealing. By the practice, therefore, of this invention, I am enabled to utilize a large quantity of wire heretofore broken or fallen out in the process of drawing down, and which has heretofore, therefore, of necessity been annealed and disposed of at a sacrifice as dull or blued annealed fine-size or stone wire, and in this particular I effect a material saving, which in large wire mills will amount to many thousands of dollars in a year.

The auction sale of the properties of the Vermont Copper Mining Company, of Ver-shire, by Receiver Gleason, of Thetford, to Francis M. F. Cazin, of New York, for \$36,000, was confirmed by Chancellor Rowell, of Vermont. The mines have been in litigation five years.

A 2-Foot Gauge Road.

An interesting account of the Bridgton and Saco Railway, one of Maine's 2-foot gauge roads, is given in the Boston *Transcript*, by Chas. O. Stickney. He says that South American railway projectors have lately been examining the road with a view to using the idea in their work. From this account we take the following:

The origin of the 2-foot road is of recent date. Its inventor, Mr. George E. Mansfield, of Boston, only a few years ago first demonstrated its feasibility by a 10-inch-gauge road, a little over $\frac{1}{2}$ mile long, in Hyde Park, Mass., adown whose straight sections and sharp curves, on a little open car, run simply by gravitation, which "that crank Mansfield," as he was then termed, safely carried members of the Legislature, of the press and other representatives. Next, the Bedford and Billerica 2-foot road, 18 miles long, the charter for which was obtained after a protracted struggle, which proved the entire practicability of the theory. For business reasons purely in a year or two the rails and rolling stock were sold to the Sandy River Railroad Company, in Maine, where they are successfully used to-day. As our narrow-gauge road, the Bridgton and Saco River, which taps the Portland and Ogdensburg (standard gauge) at Hiram, 16 miles west of Bridgton and 40 west of Portland, is a representative, and one of the best representatives of its kind, I will take it for illustration. The general reader, as well as railroad men, will readily note its unique, curious and interesting features.

The road was built in the summer of 1882 and the winter of 1882-83. That winter was notable as one of the most severe on record, the mercury for weeks at a time registering from 5° to 25° below zero, and the snow being deep; which, with the then high price of materials, made the expense much more than it would cost to build the same road at the present time. The exact length of the road is 15.9 miles, independent of sidings. The cost of construction was \$169,395; of equipment, \$26,473; total cost, \$195,868. The same kind of steel rails can now be bought from 30 to 35 per cent. less, and other materials are cheaper; so that what then cost about \$1000 per mile to construct could now be done for \$700. The rails are of steel, Cawbridge pattern, are 30 feet long, and weigh 30 pounds to the yard. Number of ties used per mile, 2640. There are two engines, built at the Hinkley Locomotive Works, Boston, each weighing 26,000 pounds, with driving wheels 30 inches in diameter; and their power, considering their small size and weight, is simply surprising, as is shown by the way they conquer steep grades with heavy loads, and force their way with ploughs through deep snows and huge drifts, by which they are seldom long detained. The two passenger cars (built at the Laconia Car Works, New Hampshire) are each 45 x 6 $\frac{1}{2}$ feet; each seats 30 passengers—one person to a seat, there being two rows of seats, is finished in solid mahogany and nicely upholstered. Between the floorings of each car mineral wool 3 inches deep renders them fire-proof, prevents any cold air from passing, and deadens the noise. These cars are run with little jar or noise on 18-inch wheels, are equipped with the Miller platform and vacuum brakes, are elegant, cozy, pleasant, comfortable—in short, are every way satisfactory, and compare favorably with their more pretentious brethren. The freight cars, some 20 in number, are 26 x 6 $\frac{1}{2}$ feet, and carry ordinarily a burden of 8 tons, although having a capacity of 12 tons. There are also a baggage mail express car, a combination car, three hand and three push cars and

a snow plow. Adopting the truism that the best is the cheapest, the company, while avoiding any hint of extravagance, made comfort, utility, durability and safety a *sine qua non*. All the trains are mixed. They ordinarily take one hour to accomplish the 16 miles of road, but have run that distance in 36 minutes. The amount of coal required for the round trip 32 miles—is 500 pounds. The heaviest grade (200 feet to the mile) is near the Hiram terminus, and is on a half-mile 20° curve. There is another curve of 18°, one of 16, one of 12, one of 11, four of 10 each, and a considerable number of less degree.

The Central and South American inspection parties learned some, to them, surprising facts in their 40 minutes' ride from Hiram to Bridgton. They learned that the little 26,000 pounds locomotive could draw a well-loaded train up a grade 200 feet to the mile; that it could easily round a 20° curve; that the seeming recklessness of attempting to run a train on rails only 2 feet apart proved a thoroughly safe performance, so far as any danger of a tip over was concerned, on account of the nearness of the cars to the ground and consequent lowering of the center of gravity; and that the three essentials of safety, speed and comfort were abundantly secured. A striking test of the capability of the system was made. The visitors were disembarked at the beginning of the 16° curve, and despite their fears and misgiving when Mansfield, who chaperoned the party, told them the train should round that sharp arc at a speed of 25 miles an hour, the thing was done before their very eyes. No wonder that the optics of Senor Ruiz, Ecuadorian consul at New York, and those of his fellow travelers dilated with astonishment. From the report of Treasurer Burnham of the Bridgton and Saco Railroad we learn that the total cost of running and maintaining the road for the first year, including taxes, repairs, insurance, salaries, damage and waste, office expenses, and all the incidentals, was only \$15,248.31. Passengers carried, 12,355; Passenger mileage, 173,835. Freight carried, tons, 6962; freight mileage, 92,926, and the road could easily do double this amount of business at hardly any increase of expense. During the whole period of operation not a passenger has been injured, not an engine nor car overturned or derailed, not a smash-up of any kind. What better record could be had? There are four other 2-foot gauge roads in Maine, the Sandy River, the Monson, the Franklin and Megantic, and another whose name I cannot now recall, varying from 15 to 18 miles in length.

A few words, in conclusion, in regard to the two roads to be built in the southern part of this continent, the possible adoption by which of the plan of the little 2-foot road away down East drew these emissaries from the South hither. The Central American road is to be built by the Honduras North Coast Railway and Improvement Company, whose president, S. B. McCarnico, lately inspected our road, and will connect the port of Truxillo with Puerto Cortez in the Republic of Honduras, 115 miles long, for the development of the trade in tropical fruits and vegetables, native woods, medicinal plants, minerals, &c., in which that region abounds. The route of the South American road is 110 miles long, and extends from San Lorenzo Bay to Isbarra, about 40 miles from the city of Quito, in Ecuador, the city being the capital of the republic, with a population of 90,000, and located at an elevation of nearly 8000 feet above sea level among the Andes Mountains. It is the intention to complete the road to Quito in time, the name of the road being the Pacific and Quito Railway. There is not a railway in the country, most of the

traffic being done on the backs of the mules, and it is proposed to build this line to help the trade of that country with America.

A Propeller Planing Machine.

In *Engineering*, of recent date, are given illustrations of a machine for planing screw propellers for high speed steam vessels put down at the works of Messrs. W. Doxford & Sons, at Sunderland, England. With this machine, all necessity for skilled workmanship is avoided, while at the same time much more accurate work is obtained, each blade of a propeller being made an exact counterpart of its fellows, both in thickness, pitch and shape. The machine is provided with two tables, keyed on a strong shaft, which can be rotated through a given range by a worm-wheel and worm, so that the inclinations of both tables to the horizontal can be simultaneously varied, and to an equal degree. One of the tables carries a cast-iron copy of the back or front of the blade it is desired to produce, while on the other table the actual propeller is secured, one of its blades occupying a similar position on this table to that of the copy on the other. To insure the rigidity of the work during the operation of machining, the table on which the propeller is fixed has its upper surface shaped to approximately correspond with the form of the blade resting on it, and is then finally brought up to the exact shape necessary by a coating of Portland cement. This plan has been thoroughly successful, as a cut $\frac{1}{8}$ -inch deep can be taken without any springing of the blade. The propeller is further secured by being mounted on a duplicate of the propeller shaft end which in turn is secured to the table. The cutting is effected by a tool of the ordinary planing machine type, work being commenced at the top of the blade, and a self-acting traverse is used to feed the tool toward the boss.

The tool-holder is connected by a system of levers with a similar holder at the other end of the slide, carrying a follower, which moves over the copy and thus guides the cutting tool. As the boss is approached the inclination of the two tables to the horizontal is altered by the worm-gear, so as to limit the necessary vertical motion of the tool. In this way all the blades of a propeller may be successfully machined, back and front, and will then be of identical form and thickness, and be set at the same angle to the propeller shaft. One of the propellers lately turned out by this machine was 6 feet in diameter, with an increasing pitch, the mean of which was 7 feet 9 inches, the thickness in the center of the blades varying from $\frac{1}{4}$ inch at the top to 1 inch at the boss. The breadth was 21 inches at the widest part and the cross-section showed a regular taper from the center line to a knife-edge. The importance of accuracy and uniformity in the shape of the blades of propellers for high-speed vessels is now generally acknowledged, and the machine described promises to form a very useful addition to the plant of a modern marine engineering establishment.

The Secretary of War has accepted the plans for a new bridge over the Ohio, between Louisville, Ky., and Jeffersonville, Ind. This will be the third bridge at Louisville. The river in front of that city is a mile wide, but it has a rock bottom, and the foundations of bridge piers can be laid without difficulty or great cost.

The Harlem Bridge Commission report that the new bridge at 181st street will cost \$2,678,650, and a question arises respecting the liability of the city for the difference above the contract price, which was \$2,055,000.

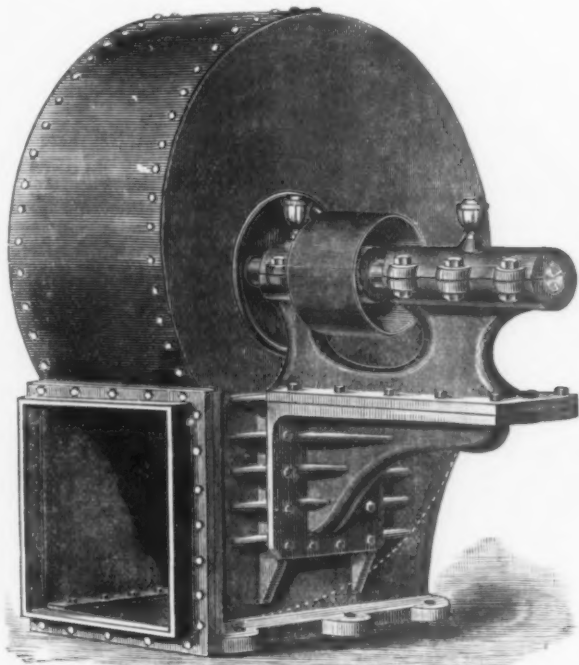
A Peculiar Boiler Deposit.

A correspondent of *The Stevens Indicator* writes as follows in a recent issue:
One of a battery of boilers at an iron plant was painted inside with a mixture of graphite and linseed oil. The boiler was filled with water and stood idle for several months, when it was put in use. Being troubled seriously with priming the boiler was opened, and a rather curious deposit was found. It consisted of masses of an irregular spherical form, porous and spongy in structure, ranging from 1 inch to 6 inches in diameter. They were soft and held a large amount of water in suspension, which could be squeezed out as from a sponge; color, a dark lead, which became lighter as they dried out. On drying, the masses became hard and friable, but still retained their porous structure. When gently heated in a crucible fumes were given off, and the mass became reduced to a powder of about one-tenth its original volume. A cold glass plate held in the

and small pipes which lead from this chamber into the connecting pipes inside the boiler. At the station a connection is made between the steam boiler and this steam chamber, and by the introduction of high-pressure steam a lively circulation is caused in the connecting tubes, which, together with the rising temperature of the water, causes a speedy evaporation of the liquid in the soda compartment, which, when the solution consists of three parts soda in two parts water, reaches boiling point at 329° F., giving a pressure of 85 pounds per square inch. The soda solution is thus never drawn out of the boiler, and this greatly simplifies the operation.

Planing-Mill Exhauster.

We illustrate on this page an exhauster made by the Champion Blower and Forge Company, of Lancaster, Pa., for planing and saw-mill work, and for the removal of dusts in general. Thus it is adapted for



PLANING MILL EXHAUSTER, MADE BY THE CHAMPION BLOWER AND FORGE COMPANY, LANCASTER, PA.

fumes showed a deposit of water and oil, which, with the characteristic smell and afore-mentioned circumstances, proved to be linseed. A chemical analysis of the residual powder proved the presence of graphite in large quantities, and small quantities of calcium, magnesia, iron and aluminum. Before being put into use again the boiler was painted inside with a mixture of crude petroleum and graphite, and no further trouble was experienced.

The Improved Honigman Soda Locomotive.—Honigman's soda locomotive has been improved and simplified to reduce the weight and cost of the boiler. According to European advices a boiler of the improved form is used in constructing the Busalla tunnel, on the line between Turin and Genoa. The locomotive boiler is of the usual type, and has at its two ends two water compartments, which are connected by pipes passing through the soda compartment. The shell and ends of the water compartments are of steel, as in former boilers, while the cylindrical middle compartment, tube and tube-plate are of copper. The only novelty in the boiler consists of a steam chamber in one of the water compartments, with a steam valve

handling fertilizers, rock dust, coal screenings, iron chips and dust in rattling rooms. The arrangement and design are clearly shown in the engraving and require no special remarks. The journals are both on one side of the exhauster, allowing no grit or dust to reach them, the inlet being entirely free and unobstructed.

In a letter to *Industries*, W. L. Wilday, engineer of the Leeds Forge, Leeds, England, gives the following interesting data relating to welding steel: "For years past we have, in the manufacture of Fox's patent corrugated boiler furnaces, been welding Siemens mild steel plates from ¼ inch to ¾ inch in thickness with ordinary gas and air, using a form of blow pipe jet. The aggregate of our welding during the past year would be represented by some 20,000 lineal feet, the tubes being from 2 feet to 5 feet in diameter, and made to work at pressures up to 200 pounds per square inch. The amount of oxide formed is dependent upon the relative amounts of gas and air employed, an oxidizing flame producing more and a reducing flame less. The surfaces of our tubes are perfectly clean and free from scale, which shows an absence of oxide.

The Record of No. 2 Furnace of the Union Steel Company.

Messrs. Taws & Hartman, of Philadelphia, have sent the following letter to the *Bulletin* of the Iron and Steel Association:
Mr. C. H. Foote, superintendent of the blast furnaces of the Union Steel Company, at Chicago, having shown us his record of furnace working in recent months, we asked him for a copy of it and permission to publish it. He promptly sent it, and it is given herewith:

DIMENSIONS AND RECORD OF THE UNION STEEL COMPANY'S BLAST FURNACE NO. 2 ("LITTLE JOKER"), FOR SEPTEMBER, OCTOBER AND NOVEMBER, 1887.
Dimensions of Furnace.—Total height, 72 feet; height under hopper, 68 feet; diameter at bosh line, 14 feet; diameter at stock line, 9½ feet; diameter at hearth, 8½ feet; size of bell, 5 feet; number of tuyeres, 6; height of tuyeres, 6 feet; size of tuyeres, 5½ inches; stock contents of furnace, 6676 cubic feet.
Number and Size of Stoves.—Two 18 feet 6 inches by 75 feet Cowper stoves with Kennedy brick.
Size of Engine.—One Cuyahoga steam cylinder, 38 inches by 54 inches; air cylinder, 84 inches by 54 inches; air per revolution, 346 cubic feet.

	Stock Record.		
	Sept.	Oct.	Nov.
	Net tons.	Net tons.	Net tons.
Connellsville coke.	2,787	3,128	2,937
Limestone.....	1,095	1,138	1,057
Minnesota ore....	1,412	1,618	1,519
Angeline ore.....	1,407	2,178	2,279
Ludington ore....	332	809	745
Cambria ore.....	1,285	249	..
Iron King.....	1,412	1,618	1,534
Total ore.....	5,648	6,473	6,077
Product No. 1 Bessemer pig	3,536	4,055	3,745
Stock for gross tons pig:	Pounds.	Pounds.	Pounds.
Coke	1,766	1,728	1,757
Limestone.....	693	629	632
Ore (yield 62.3 % iron).....	3,578	3,576	3,635

	Septemb'r, 1887.	October, 1887.	November, 1887.
	h. m.	h. m.	h. m.
Time run.....	688.10	714.18	668. 3
Time lost. . .	31.50	29.42	51.57
Total revolutions.....	1,196,280	1,244,459	1,171,937
Total cubic feet of air..	413,912,880	430,582,814	406,490,202
Ave'ge pressure.....	4½ lb	4½ lb	4½ lb
Average temperature....	1,087°	1,098°	1 069°
Cubic feet air per ton iron produced...	131,109	118 946	121,270

Laboratory Record.					
Coke: Ash, 10.21; sulphur, 0.90. Limestone: Sulphur, 0.031; silica, 0.42; alumina and peroxide iron, 2.77; carbonate of lime, 54.29; carbonate of magnesia, 42.07; phosphorus, 0.003. The analyses of the ores dried at 212° were as follows:					
Mine.	Silica.	Phos.	Water.	Iron.	
Minnesota.....	3.99	0.057	4.50	65.16	
Angeline.....	3.80	0.050	11.48	64.46	
Ludington.....	2.07	0.030	7.71	67.15	
Cambria.....	11.74	0.039	12.15	57.57	
Iron King....	5.21	0.027	13.63	61.58	

The pig iron showed 0.033 of sulphur. The furnace slag contained 35.4 per cent. of silica, 17.24 of alumina and peroxide of iron, 29.08 of carbonate of lime and 16.98 of carbonate of magnesia.

The work of Union Furnace No. 2 During December.		
	Total stock used.	Stock for 2240 lbs. of iron.
	Pounds.	Pounds.
Connellsville coke..	6,284,880	1,809
Limestone.....	2,416,500	606
Ore.....	12,854,750	3,701

Mr. Foote writes that the quantity of iron made during December, in tons of 2240 pounds was 3,473³²⁹/₂₂₄₀ tons. The

burden on the furnace at present is the same, with the exception of the limestone, as that on which the December record was made—namely, coke, 3480 pounds, limestone, 1300 pounds, and ore, 7200 pounds.

This furnace has run remarkably steady, and the iron is uniformly large grained, open fracture, and of a dark color. During November the ores and fuel used were wet from the heavy rains. During December the furnace ran uniformly, using 1809 pounds of coke to a ton of iron produced, and with an increased consumption of limestone over that used in the previous three months. Comparisons with the best data so far published of other furnaces show as follows:

		Union Fur- nace, No. 2.
Diameter at bosh....	20 feet.	14 feet.
Hight of stack.....	75 feet.	72 feet.
Cubic capacity.....	15,000 feet.	6,676 feet.
Product per 1,000 feet capacity.....	97.5 tons.	117.8 tons.
Yield of ore.....	63 %.	62.3 %.
Limestone used.....	14.3 %.	18.1 %.
Fuel per ton of iron produced.....	2,026 %.	1,750 lb.
Best average of four weeks on fuel.....	1,862 lb.	1,728 lb.
Sulphur in iron.....	0.05 %.	0.033 %.

Zinc-Workers' Wages.

The daily *Inter Ocean*, of Chicago, in its issue of the 6th inst, publishes very interesting interviews with Archibald Means, of the Illinois Zinc Company, of Peru, and Messrs. Matthiessen and Hegeler, of the famous La Salle works. In these interviews the relative wages paid to zinc-workers in America and in Silesia are given in detail. Mr. Matthiessen is authority for the following comparative statement of wages paid in sheet zinc manufacture in Silesia and at La Salle: In the former country the men work 10 hours a day, while at La Salle they work only 8. The wages at the latter point are computed on the basis of a 10-hour shift:

	U. S.	Silesia
	Per day.	pays.
Rollers.....	\$4.10	\$1.76
Catchers.....	2.15	1.23
Helpers (boys).....	1.10	.66
Dippers.....	1.85	.91
Helpers (boys).....	1.30	.72
Shearmen.....	2.40	.91
Firemen (boilers).....	1.80	.96
Stretchers.....	3.75	1.14
Catcher stretchers.....	1.88	.81

The correspondent of the *Inter Ocean* quotes from the supplementary report on the labor statistics of the Illinois Bureau of Labor Statistics, the following, which all illustrates clearly the effect of steady work:

An illustration of what a given number of miners can accomplish, when kept continuously and regularly at work, is found at the mine of the Matthiessen and Hegeler Zinc Works, at La Salle. This establishment consumes the entire product of its mines in the manufacture of zinc; and the quantity required is substantially uniform for every working day in the year. Under these conditions 46 miners deliver from a 5-foot seam an average of 240 tons a day, or 74,310 tons in a year of 310 working days, which gives an average of 1615 tons a year to each man, which at 55 cents a ton gives to each an average annual income of \$888.25, or \$74 a month. On the other hand, there is reported at twelve other mines in La Salle County, working from 3 to 5 feet of coal by hand, an average of 1713 miners, whose aggregate product is 893,078 tons, or 521 tons to the man, which at an average of 84 cents a ton gives to them an average of \$437.64 per annum. The great advantage a miner enjoys in a place at the works of Matthiessen-Hegeler consists in the regularity of the work, and if this firm were disposed to take the utmost advantage of their situ-

ation, they could doubtless fill their mine with men at 45 cents a ton, while others offering less regular work were paying 90 cents.

Electric Sunstroke.

Under the above head *Engineering*, of London, directs attention to a paper recently read before the French Society of Surgeons by M. Defontaine, doctor-in-chief to the Creusot Steel Works. M. Defontaine states that workmen employed in operating the electric forges at Creusot are subject to a form of sunstroke, which he attributes to the intense light radiated from the focus of the forge. Ordinary arc lamps are incapable of producing such effects, as the light is not sufficiently intense, but these forges emit a light of more than 100,000 candles from a few square centimeters of surface, producing on men exposed to their glare physiological consequences previously unheard of. Frequently, after two or three hours' work, the men complain of pains more or less intense in the neck, the face and the forehead, simultaneously with which the color of the skin is changed to reddish-brown. Further, in spite of the precaution taken by the men of shielding their eyes with dark glasses, the retina is affected to such a degree that for some minutes after ceasing work the operatives are totally blind to all objects illumined with common daylight, nor is perfect vision restored till nearly an hour after. The conjunctiva are irritated, and remain in a state of congestion for 48 hours, and this is accompanied by a painful feeling as of some foreign body introduced under the eyelids. The secretion of tears is augmented, a constant flow being kept up for 24 hours, during which the patient suffers from insomnia, due to pain and the abnormal flow of tears, and possibly also to fever. During the following days the skin peels off the face and neck, which become of a deep red color, fading away about the fifth day. In cases of ordinary sunstroke heat may have some influence, but in those considered above the whole effect is due solely to the action of an intense light.

A New Departure in Brazing and Welding.

Mr. Thomas Fletcher, the well-known English engineer, writes as follows in a recent issue of *Engineering*:

The cheapening of oxygen by Brin's process of manufacture has put into the hands of metal workers a new power. I have recently made a few experiments with the compressed oxygen and coal gas, and found that with a $\frac{1}{2}$ -inch gas supply a joint could be brazed in a 2-inch wrought-iron pipe in about one minute, the heat being very short, the redness not extending over 1 inch on each side of the joint. The appearance of the surface after brazing led me to experiment further with welding, a process which is not possible with ordinary coal gas and air, owing to the formation of magnetic oxide on the surfaces. Contrary to my expectation, a good weld was obtained on an iron wire $\frac{1}{2}$ inch in diameter, with a very small blow-pipe, having an air jet about $\frac{1}{2}$ in. diameter. This matter requires to be taken up and tried on a large scale for such work as welding boiler plates, which, it appears to me, can be done perfectly with far less trouble than would be required to braze an ordinary joint. The great advantage of this would be that the boilers would require no handling, but could be welded with an ordinary large blowpipe in position, and with about one-tenth the labor at present necessary.

The cost of the oxygen is trifling, and it is evident from the results obtained in

brazing that the consumption of gas would be considerably less than one-fourth that necessary with an air blast, irrespective of the fact that welding is possible with an oxygen blast, whereas it is not possible if air is used. The surface of iron heated to welding heat by this means comes out singularly clean and free from scale, and a small bottle of compressed oxygen with a blow-pipe and a moderate gas supply would make the repairs of machinery, boilers, brewing coppers and other unwieldy apparatus a very simple matter. The trouble and difficulty of making good boiler crowns, which so frequently "come down," would be very small indeed if the workman had an unlimited source of heat at command, under perfect and instant control.

Device for Keeping Fire Water Pails Full.

The *American Architect* mentions a device of some value for promoting the efficiency of that simple fire-extinguishing apparatus, a pail of water. According to insurance statistics, more fires are put out by water-pails than by all other appliances put together, and they ought to be always within reach. In point of fact, however, although the pails are generally provided abundantly in hotels and office-buildings, the water is very apt to be wanting, and even if kept full the pails are often borrowed for some purpose and not returned, so that when most needed they are of no avail. A common way of meeting this difficulty is to use pails with round or conical bottoms which will not stand on a floor, and are, therefore, not likely to be borrowed, but this formation seriously diminishes the value of the pail as a fire extinguisher, since a man with two of them in his hands, arriving at the scene of action, cannot use either without setting the other on the floor and losing all its contents. As an improvement on this a mill manager, who had found it difficult to keep the fire-pails filled and in order, recently fitted up the hooks carrying the pails with pieces of spring steel strong enough to lift the pail when nearly empty, but not sufficiently so to lift a full pail. Just over each spring, in such a position as to be out of the way of the handle of the pail, was set a metal point connected with a wire from an open-circuit battery. So long as the pails were full their weight, when hung on their hooks, kept the springs down, but as soon as one was removed or lost a considerable portion of its contents by evaporation the spring on its hook would rise, coming in contact with the metal point, thus closing the battery circuit and ringing a bell in the manager's office, at the same time showing on an annunciator where the trouble was. As the bell continued to ring until the weight of the delinquent pail was restored it was impossible to disregard the summons, and the ingenious manager found no more reason to complain of the condition of his fire-buckets.

The resources of Colorado are the frequent theme of correspondents. Denver, the capital, although but 30 years old, now has a population of nearly 90,000. The volume of business for Denver during the year that has just closed is estimated by the secretary of the Chamber of Commerce at \$114,000,000, an increase of 25 per cent. over that of the preceding year. The real estate transfers for 1887 amount to \$30,000,000, an increase of \$18,000,000 over the preceding year. Manufacturing is yet in its infancy in Colorado. The manufactured product of Denver for the year 1887 is estimated at \$32,000,000, an increase of \$7,000,000 over the preceding year.

The Ironton Mine.

One of the many wrecks of the Gogebic iron ore mining boom appears to be the Ironton. In its issue of the 8th inst. the *Boston Transcript* prints the following:

An informal meeting of Ironton Iron Mining Company shareholders was held at Young's Hotel to-day to hear a statement of the company's affairs from the secretary and treasurer, Mr. Zerbe. The present embarrassments and its causes were clearly set forth. The details are not of general interest, but may be briefly stated like this: The debt of the company was incorrectly stated on January 1, 1887, when the present parties came into control, owing to the omission of the pay roll due December 25. The property was badly mismanaged; lake freights were excessive; the soft hematite ore body, of 75 feet width and 75 feet depth, became pinched to a few feet and changed to a small body of hard hematite, which it would not pay to mine. Royalties ran behind, and finally the company found itself in debt some \$43,000. Creditors became clamorous, and, to raise the money, a \$100,000 mortgage was created, and the bonds were offered to stockholders at 60 per cent. of the par value, the same to bear 8 per cent. interest. When the situation dawned upon the management a retrenchment policy was adopted, and the sinking of a temporary winze was begun through the hard hematite, with a view to find a second body of soft hematite which is believed to exist at a lower level. The adjoining Tontine mine found this second body 100 feet below the bottom of the Ironton winze, and the Ironton management authorized the expenditure of \$1000 per month in reaching it. The speaker believed that it could be reached in two months, and had hopes that the bond investment would not only be repaid, but that something might be earned on the stock. The bonds would pay all debts and leave a surplus of \$15,000. He was free to confess that he would not invest in the property if it was presented to him as a new enterprise, but he would take his proportion of bonds in order to save his former investment. His associates in Cleveland, Wheeling and Pittsburgh would do likewise, and he hoped the Eastern stockholders would join them in the subscription. Major Burt, who placed the stock in the East, was declared a co-sufferer in the misadventure, and his course was remarked as honest. To a listener it appeared clear that there was gross carelessness on somebody's part in accepting the statement of the financial condition of the company without thorough investigation, and a mistake made in banking upon a surface outcropping of ore without proving it. That, however, was an incident of the times. Gogebic iron-mining schemes were booming late in 1886 and early in 1887, and there was more money in placing shares than in proving property. As usual, the confiding public has paid the price of negligence, and it is once more demonstrated that whoever invests in that of which he knows nothing is a participant in a game of chance. Said an Ironton victim to-day: "I have charged my investment to profit and loss, and prefer to turn to something else rather than send good money after bad. I prefer to invest in something which I can see." It does not look as if Boston stockholders would take kindly to an 8 per cent. bond at 40 per cent. discount.

• The annual trade review of San Francisco shows that the imports include 9,412,000 pounds of wire. The demand for barb wire is large and increasing. The imports of rods for the year were 5,000,

000 pounds, valued at \$50,000; wire rope, 874,000 pounds, valued at \$44,355. Hardware imports by rail are put down at 16,669,000 pounds, as compared with 15,385,000 pounds for the previous year. The transportation question proved one of the most important problems of the year. The Interstate Commerce law was expected to advance rates of freight unduly, and the tax freight to act as a sort of protection to California manufacturers. This, however, owing to the action of the commission appointed to administer the law, it failed to do. The result, however, is an advance in freights over the figures that marked the early part of the year.

A New Buffing Lathe.

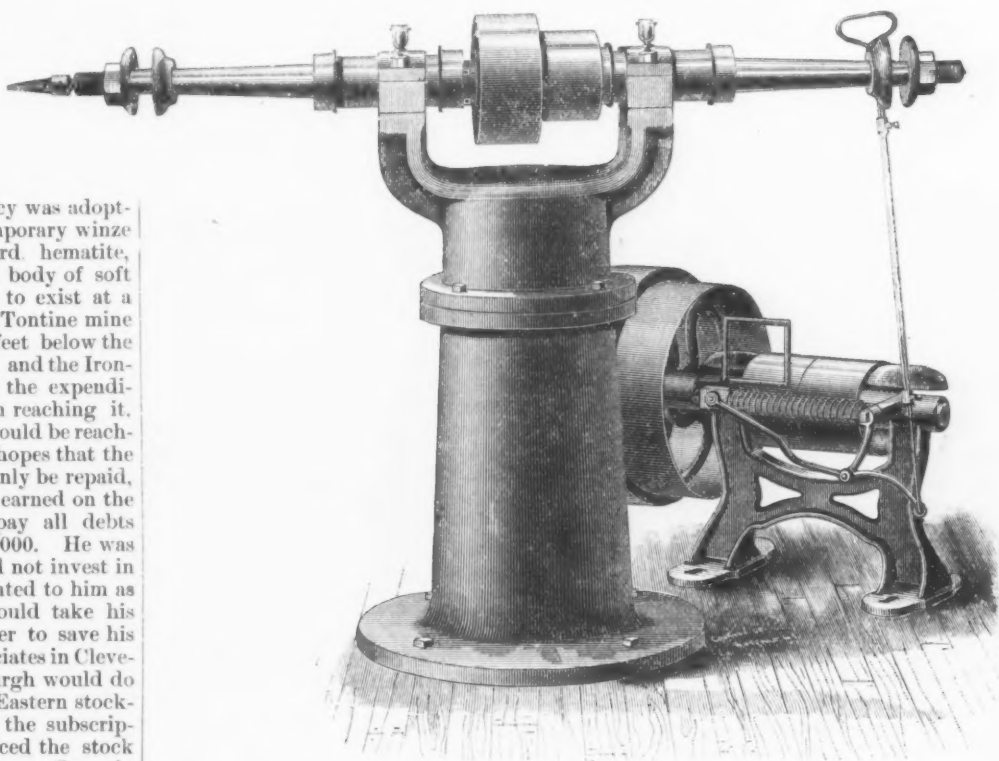
The Springfield Glue and Emery Wheel Company, of Springfield, Mass., have turned out a new design for a heavy, strong, durable buffing lathe weighing about 450 pounds. The spindle is 48 inches long, giving ample room to handle large pieces in any position and clear the

dise by sample, catalogue, card, price list, description or other representation, without payment of any license or mercantile tax." The aim of the bill is to prevent towns, cities or districts throughout the United States levying a tax or license upon such commercial salesmen as visit them. In many of the Southern States and in the District of Columbia such taxes exist.

Power from Hot Water.

Respecting the power which can be stored up in a boiler surcharged with steam and water at high temperatures the *London Engineer* makes the following calculation, embodied in an article on the Nordenfeldt submarine boat:

The submarine boat Nordenfeldt uses the system suggested many years ago by Doctor Lamb, and used by him for propelling street cars. If the pressure in a boiler is lowered the temperature falls, and part of the sensible heat of the water becomes converted into latent heat by evaporation. The two boilers contain about



NEW BUFFING LATHE, BUILT BY THE SPRINGFIELD GLUE AND EMERY WHEEL COMPANY, SPRINGFIELD, MASS.

frame. A $\frac{3}{4}$ -inch hole is tapped out at each end of the spindle for screwing in extra heads made to carry small emery wheels, felt wheels, walrus wheels, &c. The bearings are 6 inches long and the spindle is 2 inches diameter in the bearings, tapering to $1\frac{1}{2}$ inches at each end, where the wheel goes on. The spindle is made with a tight and a loose collar and nut as shown, or turned to any desired taper to hold wheels on by friction. It is also made with small tight and loose collars for carrying rolls for grinding out car brasses, circles, curves, &c.

One of the most important bills before Congress in relation to the Interstate trade of the United States prohibits the taxation of commercial travelers. It was drawn up by Senator Evarts, and it is claimed that the wholesale dealers and traveling salesmen of the United States are a unit for it. This bill provides that "residents of each State and Territory may, within the other States and Territories and within the District of Columbia, solicit from dealers or merchants orders for goods and merchan-

dis, 27 tons of water. The pressure of the steam is, let us say, 160 pounds above the atmosphere, or 175 pounds absolute. The corresponding temperature is 371° F. Now, the engines will work well with steam having a pressure of 50 pounds above the atmosphere, or 65 pounds absolute, the temperature of which is 298°. In falling from one of the temperatures to the other, each pound of water gives out 371° - 298° = 73 units. There are 60,480 pounds of water, and 60,480 pounds \times 73 = 4,415,040 units. Each pound of steam at 65 pounds pressure will represent 904 units, and $\frac{4,415,040}{904} = 4883$, nearly, pounds

of steam of 50 pounds pressure, which can be supplied after the ship has been submerged. Assuming that her engines use 20 pounds of steam per horse per hour—a very high estimate—we have $\frac{4883}{20} = 244$ horse-power for one hour.

Three British tramp steamers, chartered by Naylor & Co. to load iron ore at Carthagena for Philadelphia, are given up as lost.

THE WEEK.

President Corbin, in his reply to the Executive Committee of the Knights of Labor, disclaims all knowledge of any difficulty between the Reading Railroad Company and its employees, and as concerns the Coal and Iron Company, he refers the matter to President Keim, who replies that upon the men returning to work the question of wages can be discussed, but with the prior understanding "that no basis different from the one already in existence will be established that will require this company to pay more for labor for the same class of work than is paid by its competitors."

A Board of Trade has been formed at Ironton, Ohio, and a committee appointed to nominate officers. The organization has among its objects the promotion of the industrial resources of the locality and the encouragement of those who may desire to settle there for the prosecution of business. Capt. P. S. Hart was chairman of the initial meeting.

The Winnipeggers persist in their determination to build a railroad direct to the United States line, alleging that the Canadian Pacific line is unable to transport to the seaboard the enormous grain crops of Manitoba. They hope to thwart the will of the Dominion respecting this scheme.

St. Louis packers will supply New York with dressed beef shipped direct to Patchogue, Long Island, the cars to be sent across the East River in floats to a commodious depot, about to be erected.

Byron D. Benson, widely known in business circles in New York, Pennsylvania and New Jersey, died in this city on the 3d inst. He built the first long-distance pipe line in the oil region and extensive works at Bayonne, N. J., and Chester, Pa.

The president of the Yankton, Dak., Board of Trade pronounces the recent statements respecting the loss of life in that territory during the blizzard gross exaggerations. "In reality not more than 175 lives in all were lost, or at the outside 200, and this when 75,000 children were in school in an area of 150,000 square miles."

An electric railroad for Philadelphia is to be built, and among the incorporators of the company is Crawford Spear, a retired stove manufacturer.

The Lehigh Valley Railroad Company are building two steel ships at Buffalo, which will be added to the fleet of steam colliers on the lakes already belonging to the company, and form a line to run between Buffalo and Gladstone, the lake shipping port of the Minneapolis, Sault Ste. Marie and Atlantic road, or, as it is better known, the "Soo" line, thus forming a direct through route from the East to the Northwest.

Manual training will soon be introduced in the Normal College of this city. In announcing the fact, the assistant superintendent of the Board of Education spoke of the variety of articles made in the schools of Russia, where their manufacture forms a part of the curriculum. The system was adopted apparently for the reason that it makes skillful mechanics, and by lifting the character of workmanship protects the manufactures of the country.

Steamship companies in the Transatlantic trade complain of unusual dullness even for this season of the year. Exports are light, so that grain is taken on the lowest terms for ballast, but for the Western trip good cargoes are secured.

Texas is probably the only State in the Union troubled with a surplus that she does not know what to do with. At the end of January the surplus was \$1,725,000, while the assessments for the present year

will result in the additional collection of \$750,000 over and above the current expenses of the year.

The Congressional committee for the investigation of trusts has not yet taken any definite action, but is collecting information from various sources preparatory to work.

It is announced from Boston, as by authority, that for the present, at least, there will be no "rubber trust," and that in any case the trade for 1888 will not be affected.

The Newark Knights of Labor demand an inquest in the case of a man who was killed by an elevator accident at Saloman's tannery. The men employed there are "scabs," and the concern, therefore, obnoxious to the knights.

The draft of a proposed treaty with China absolutely prohibiting Chinese immigration to this country has the approval of the Chinese Minister at Washington.

The Ship Owners' Dry Dock Association has been organized at Cleveland, and will invest \$100,000 in their new enterprise. Capt. Thos. Wilson is president and William Radcliff general manager and superintendent.

A State retail grocers' association is about to be formed in Cleveland, Ohio, mainly with the object of securing the several members against bad debts. A bill before the Legislature provides for the collection of fines and penalties where business is carried on without a license.

The New York State Board of Health in its report to the Governor recommends radical improvements in the Quarantine station.

The late Seabury Brewster, of this city, formerly a dry goods merchant, whose store property on Broadway sold a few days ago for nearly \$250,000, allowed the building to remain vacant 30 years rather than lease it below its supposed rental value, meanwhile paying \$20,000 per annum to the tax collector.

A radical change in through export freight tariffs was agreed upon by the Executive Committee of the Eastern trunk lines at a meeting held on Friday. The plan adopted a few months ago by averaging the ocean rates from Baltimore, Philadelphia, Boston and this city to ten European ports, and by averaging the rates from Chicago to these seaports, and then adding these two together, making a fixed rate, had not worked, and it was finally decided, after a long discussion, to return to the old plan, to take effect 20th inst., providing that the rates on export traffic be the sum of the inland tariffs plus the ocean rates current from time to time, except that the inland rate to Boston on export traffic may be the same as to New York, it being understood that on grain shipments the elevator charges at point of export shall also be added.

The long-talked-of South Penn Railroad, in which the Vanderbilts and other prominent capitalists are interested, gives some signs of renewed vitality, but there appears to be little prospect of an immediate resumption of the work in which \$7,000,000 have already been invested. The road, as projected, extending from Harrisburg to Pittsburgh, a distance of 225 miles, is intended as a direct outlet to the West for the Reading, and to open up a new route to the seaboard from Pittsburgh, forming a system in direct competition with the Pennsylvania Railroad. New York is promised, through the new route, more liberal supplies of bituminous coal.

The so-called sugar trust or combination of refiners in this city is reported to have placed a mortgage upon the plant of the various companies represented in the trust to the amount of the value of the plant,

which is supposed to be somewhere between \$15,000,000 and \$20,000,000. The trust is said to be still squeezing down the price of raw sugar below its market value, and is slowly stocking up at low figures, while at the same time the price of the refined sugar to the consumer is maintained at high figures. There is now a cargo of centrifugal sugar on the way here from Cuba, which was offered to the trust, and the only bid was at 3 cents a pound, plus cost and freight, which the owners had to accept. This was a reduction of a clear $\frac{1}{2}$ cent a pound, due, so the sugar men claim, entirely to the fact that the trust has absorbed all the refineries and thereby stopped all competition.

The British Queen's address at the opening of Parliament says the prospects of commerce are more hopeful than for many years. There has been no corresponding improvement in British agriculture. The Parliament will be asked to consider measures for promoting technical education.

Senator John Sherman, in an after-dinner speech, at Boston, expressed surprise that so many persons of character and intelligence are willing to hazard the wonderful development of our home industries in the desire to increase of foreign commerce. He is thus reported: "The home market deals with over \$8,000,000,000 annually of agricultural products, and \$6,000,000,000 of manufactures; while the foreign market deals with only \$1,500,000,000 of exports and imports annually, and more than half of these are home products. This is not all; every part of the capital and labor employed in the productions of the home market is American labor and capital. These productions are by American farmers and workshops, and they are transported on American railroads, steamboats and wagons. On the other hand, our foreign market is conducted entirely by foreigners. Nearly one-half of it is in foreign products, made by foreign labor, largely by people whose daily wages would not buy food, saying nothing about clothing and shelter, that is consumed by the American workmen, and yet the price of all food is confessedly cheaper here than in Europe."

A concession has been granted by the Government of Mexico to a company known as the New York and Yucatan Steamship Company for a line between New York and Progreso. The company propose to control the carrying of the hennequen crop. This concession is owned by New York parties.

Walter W. Adams, who for more than five years acted as superintendent of the old Department of Buildings of this city, died at his residence in this city on the 8th inst.

A St. Paul dispatch speaks of the freight war on Western roads as calculated to establish the mercantile strength and importance of that city and of Minneapolis. Furthermore, it is said to be the general opinion that "hereafter Eastern purchases will be made in New York, while St. Louis will control the Southern trade."

The improved Paris grooved rail, recommended by Mayor Hewitt for general adoption in this city, meets with the combined opposition of the railroad companies.

The appropriation of \$1,000,000 for the improvement of the New York State canals is vigorously pushed in the Legislature by representatives of New York City and Buffalo. Senator Potter urges the measure as one of vital importance. Figures, he says, prove that the railroads cannot hold the grain trade against inducements offered by other routes to competing cities. Navigation being closed, the city is behind her rivals. When the canals are open, however, New York surpasses them all combined. In 1887, with the canals open, New York's receipts were

74,563,509 bushels, while those of Philadelphia, Boston and Baltimore were in the aggregate but 33,118,919 bushels. New York received by canal alone 46,009,200, while the three other points got from all sources combined but 33,118,929. During the same year the canals delivered in New York 17,805,038 bushels more than all the railroads and 17,454,891 more than all the other routes, or 61.57 of the entire amount.

The Salmon pack of the Pacific Coast for the past season was nearly 1,000,000 cases, of which about 374,000 were from the Columbia River, 202,000 from the Fraser River, and 190,000 from Alaska.

The Massachusetts Railroad Commissioners, since the wrecking of a train nearly a year ago through a defective bridge, have made a thorough examination of bridges in that State, and in their report to the Legislature, just published, speak of a startling disregard of the law requiring that plans of all such structures shall be submitted to the Railroad Commissioners on demand. Many companies had no plans or strain sheets whatever of the majority of their bridges, or any definite knowledge of their condition. Weaknesses before unsuspected were disclosed in the structures upon some of the best roads in Massachusetts, and the presumption is that measures are being taken to remedy the defects.

The agricultural report from Washington respecting the number and value of farm animals of all descriptions shows that the largest rate of increase is in horses, which number over 13,000,000 and are valued at \$946,000,000. The increase in cattle makes the aggregate 49,000,000 head, representing a value of \$978,000,000. The grand aggregate of values, allowing \$175,000,000 for mules, \$221,000,000 for swine, and \$89,000,000 for sheep, is \$2,409,000,000.

According to an Oil City letter, it has cost \$50,000,000 to pay the storage and carrying charges on the stocks since Jan. 1, 1881, or very nearly twice what the entire amount of oil on hand would bring if sold at present prices.

A special committee of Congress appointed to examine the Internal Revenue Department finds that stamps valued at \$186,000,000 were handled without loss to the Government. Every stamp was accounted for.

Judge Daly, in his advocacy of the maritime canal of Nicaragua, says he has positive assurances that \$100,000,000 of bonds will be taken by bankers in Berlin, New York and Boston, where a charter has been obtained from the United States Government.

The report of the Health Officer of the port of New York, made to the Legislature, shows the total receipts for the year 1887 to have been \$51,894, while the disbursements amounted to \$21,113. These figures vary but slightly from those for 1886. The principal receipts are derived from the inspection of vessels.

A letter from Merced, Cal., brings full details of the huge irrigating ditch begun in Tulare County five years ago and recently completed. The writer says: "The Merced Canal is 27 miles long, is 100 feet wide at the top, 70 feet wide at the base and 10 feet deep, and it will irrigate 300,000 acres. It is situated in the heart of the great San Joaquin Valley, 141 miles southeast from San Francisco. It stretches from the Merced River clear across the purest barren plains to the town of Merced on the line of the Southern Pacific Railroad. It will convert what has been a desert ever since the settlement of California into one of the richest grape and fruit regions in the State. It will people this great valley with homes, and will

probably in 20 years add as many thousands to the population of the State." The canal has cost, in round numbers, \$1,500,000. The projectors expect to extend it another 25 miles to the southwest, if sufficient inducements are offered by the holders of land.

The recent appointment of Count Okuma as the head of the Japanese Foreign Office, which became vacant upon the failure of the attempt to revise the treaty with foreign powers, is an event of more than ordinary significance in the history of that most interesting of all Asiatic countries. The rupture of negotiations was the result of insisting upon the acceptance of terms which would have been degrading to Japan as an independent Government. The feature most odious to the Japanese was the proposition to establish courts at the several treaty ports, in which the diplomatic corps would exercise an authority superior to that of the Government at Tokio in all cases where aliens were concerned as plaintiff or defendant. A dissolution of the Ministerial Cabinet was inevitable when the alternative was presented of acceptance or rejection. It remains to be seen whether Count Okuma is equal to the emergency, and will be able to secure treaty revision on a basis consistent with the national honor. Those who are interested in the future development of Japan will observe intently the events of the next few months as affecting her foreign relations.

The public building raid upon the United States Treasury, now contemplated by the bills being pushed before Congress, involves an aggregate expenditure of at least \$25,000,000. The following is a summary of the amounts called for, classified according to the section of country whence the applications are made:

	Buildings.	Total cost.
Eastern States.....	13	\$1,521,000
Middle States.....	23	3,315,000
Western States.....	60	11,183,500
Southern States	48	7,795,000
Territories	5	1,180,000
Total	149	\$24,994,500

New York wants ten buildings, to cost \$2,665,000; California is next in order with eight buildings, to cost \$2,123,500.

Within the last 30 years a large portion of the warehouse business done on the East River front has been transferred to Brooklyn, where there are now five or six miles of water front devoted to the handling and storage of ships' cargoes. According to one estimate 75 per cent. of the bulk, and nearly 60 per cent. of the value of the exports and imports of the port of New York are handled over the Brooklyn piers. This statement is made by a writer in the Brooklyn *Eagle*, on information obtained from a Custom House officer. All heavy merchandise passing through the port of New York, if it is to remain any length of time in a warehouse, must go to Brooklyn, and it can hardly be said that there is any alternative. There have been handled 2,500,000 bags of coffee and nearly 900,000 tons of sugar at the Brooklyn warehouses in a single year.

A report comes from Boston that the floring mills of the country are on the eve of consolidation upon the sugar-trust plan for mutual protection and exaction of better prices and the guarding against overproduction, and that the great mills of Minneapolis, Detroit and the Northwest are prime movers in the scheme.

The scarcity of skilled labor in California has influenced the San Francisco Board of Trade to adopt the suggestions of a prominent vine grower, and appeals to laborers, whether skilled or unskilled, to come to the Pacific coast. It is stated that in nearly every trade and business wages are from one-third to one-half higher in California, while the cost of living is cheaper. Mechanics and skilled labor

is worth from \$3 to \$6 per day; farm laborers, from \$20 to \$30 a month. Throughout the Southern counties the demand for carpenters and bricklayers has outrun the supply, although \$6 per day is offered to good masons.

The city of Brooklyn in many respects compares well with any other city in the Union. Some idea of its growth can be obtained from the following table, showing the number of permits for the execution of new buildings issued each year from 1882 to 1887 inclusive, and their estimated cost:

1882	2,375	\$10,386,769
1883	2,688	12,096,681
1884	3,080	14,370,714
1885	3,902	19,411,042
1886	4,011	19,473,472
1887	4,246	19,983,414
Totals	20,322	\$95,722,092

The total amount of taxable property in 1887 was \$362,166,083. The total value of the personal property that was subject to taxes was \$14,474,591. These figures show an increase over 1886 of \$22,329,642. The elevated railroads are giving to the city a new impetus.

The Newark, N. J., water commissioners will ask for \$450,000 to build a new storage reservoir and increase the pumping facilities. The site selected for a new reservoir lies along the bank of the Morris Canal, and was originally a natural lake nearly $\frac{1}{2}$ mile in length. Should Newark succeed in getting a new supply from the Passaic above Paterson or Little Falls, the new reservoir will still be valuable for storage, as it has sufficient elevation to supply the lower part of the city without pumping.

The growth of the steamship interest in Great Britain, and how it is displacing the tonnage of the United States in the carrying trade of the ocean, appears from the report of the annual meeting of the Chamber of Shipping of the United Kingdom, just held in London. The president, in the customary address, said that the statistics of last year showed that 35 iron steamers were built or in process of construction, against 57 in 1886, and 256 of steel, against 137; as to sailing vessels, 12 of iron, against 39, and 18 of steel, against 11. From these figures he concluded that steel as a material in the construction of vessels was rapidly superseding iron; that sailing vessels, even of larger type, were found unable to compete with the newest type of steamer, and that composite and wooden sailing vessels for mercantile purposes had ceased to be built.

A phenomenally large increase in the freight business of the Pennsylvania Railroad system during the past year is attributed by an official of the company to the Interstate law, which resulted in a steadiness of rates, giving shippers more confidence. The weak point in the law, according to the authority quoted, is the advantage given the Canadian railroads.

Arrangements have been completed for the formation of the Wall Street Electro-Pneumatic Transit Company, the purpose of which is to supply connection between brokers' offices and the Stock Exchange by pneumatic tubes. Some of the largest firms in the street are interested in the experiment.

It is reported that the naphtha and oil merchants of Baku have resolved to start a company for the supply of naphtha and kerosene to the different ports of China, Japan and Siberia. With the object of creating a sale of these products in the East on a large scale, kerosene warehouses and shops for the sale of lamps are to be constructed at Vladivostock and Petropavlovsk. From these central warehouses kerosene and lamps will be sent to the retail shops which the company intend opening in the towns of Eastern Siberia and China.

THE READING STRIKE.

Its Effect Upon Founders and Consumers of Pig Iron.

Some time since we had occasion to place before the readers of *The Iron Age* a series of letters from producers of pig iron, and manufacturers of iron generally, showing from their own standpoint what had been the effect upon their business of the suspension of mining in the Schuylkill anthracite region. The operations of furnaces and rolling mills are on so large a scale, and, so far as the former are concerned, statistical work is so thoroughly systematized, that the influence of a shortage in the usual fuel supply can be quite accurately gauged. We know very closely what is the production, but we possess only a very vague idea of how the contest between miners and employees is influencing founders and that large class of consumers of iron whose operations are influenced by the use of anthracite coal for melting iron, and who buy largely of pig iron produced with anthracite as a fuel. In reply to inquiries we have received the following communications. The evidence submitted will allow the trade to judge fairly what effect the strike is having over a large territory, and upon a wide range of industries. A Massachusetts manufacturer of lawn mowers writes:

The strike in the coal regions has affected us indirectly to a very great extent, and has caused us and the foundry making our work to expend hundreds of dollars. Our castings are made on contract. We have always got from the firm nice soft iron until this year, but the very first lot received this season was so hard as to be impossible to work many of the pieces. This has run all through the season, and where our work was done by "piece work" in the shop, it has had to be done by day work, we furnishing all tools. Enough tools have been used this year so far to last ordinarily five years. As a final result, we have been obliged to ship every casting back to foundry and have it annealed. This process adds largely to the cost, as it takes a week to do it right. The whole difficulty has been sifted down to this: Wrong kind of coal. The coal that should have been used could not be had at any price, and that which was used did not allow the metals to mix sufficiently, and castings were hard in spots. We may add that the iron used in these hard castings was from the same lot and pile as last season's, so there is no doubt but that all our trouble has been caused by inability to get the right kind of coal. We are now using annealed castings altogether. You can judge of the extra expense this is to the foundry. As for ourselves, we have had no piece of mind nor cessation from trouble above mentioned since our manufacturing season opened, and the whole matter sifts down to the words "coal strike." As to future results, should this state of affairs continue it would stop our works, for we could never run and be at the extra expense which has been forced upon us this winter.

Wm. Shimer, Son & Co., sad irons, hardware and house-furnishing specialties, Freemansburg, Pa., say:

The only evil effect resulting to us from the strike in the coal regions is the fact that we are obliged to use an inferior coal at increased cost. Have had no difficulty in getting all the coal and iron we required, and, in our opinion, the trouble will have no evil influence on our business though it continue a twelvemonth longer. In fact, we have more business now than we have had since its existence.

A Reading, Pa., manufacturer of hardware writes:

We do not see that the present strike in the coal region has any serious effect on the iron industries in this valley. As far as our own trade is concerned it has had no effect whatever, our trade not being local, but extending over the Western States generally. Our trade has been fairly active since December. We have been running to our full capacity during that time, and, from present indications, expect to continue doing so for some time to come. We use only strictly No. 1 pig iron, and judging from recent purchases the price has not been affected at all by the coal strike. The price is fairly steady for this grade of pig iron, and that it is not affected seriously is owing, we presume, to the lessened demand for pig iron generally. We are led to this opinion from the fact that

our purchases of pig iron are made in both the anthracite coal and coke regions. As far as we can see the coal strike, even if prolonged indefinitely, will not have any effect on our trade. The strike in the Schuylkill region, from present appearances, seems to be nearing an end.

A Philadelphia firm of manufacturers of hardware and malleable castings express the following opinion:

The general effect of the stoppage of the supply of anthracite seems to be that Western coke is filling up the vacuum as fast as it can be brought to the market. Most of the foundries here, and we presume it is the same in our immediate neighborhood and further West, have substituted coke to the extent of at least two-thirds of their supply for melting purposes, with very excellent results. Coke is a more satisfactory fuel than anthracite, and the price is not materially greater. The only difficulty is that it takes up more room for storage.

A large Connecticut manufacturer of pumps offers the following:

The strikes in the anthracite coal regions have had no appreciable effect upon us as yet. We supplied ourselves last fall with sufficient material to last us into the summer. We have not bought any anthracite pig iron for several years, and we have abandoned the Pennsylvania product for that of Virginia coke iron, which can be delivered at our port by vessel at a better price than we can purchase in Pennsylvania delivered at Perth Amboy, to which we must add a freight rate of \$1.50 per ton to deliver here. We find the Virginia iron much softer; it runs more even, and gives better results than the Pennsylvania iron, besides costing less money. Should the strikes continue many months longer we presume we shall have to pay higher prices for anthracite coal. This is the only effect it will have upon us. In all the 55 years of our business experience we have never had a strike of any description, and think these matters can usually be arranged without an open rupture, providing the employers are practical men accustomed to handling employees, and a little common sense is used on both sides.

Chadborn & Coldwell Mfg. Company, manufacturers of lawn mowers, Newburg, N. Y., say that the trouble in the coal regions has in no way affected their business except to slightly increase the cost of production by reason of the advance in price of coal; beyond this they cannot see that it will interfere with their business prospects for the present year.

A Philadelphia firm of iron founders and hardware manufacturers write: "We would merely say that we have not been injuriously affected to any perceptible extent up to the present time. Were the strike to continue for an indefinite period it might affect us detrimentally, but we do not apprehend that such will be the case."

A Philadelphia hollow-ware foundry reports:

The strike in the coal region has: 1. Forced us to use bituminous coal for part of our operations, to our disadvantage. 2. It has forced a price upon us we cannot afford to pay for such anthracite as we are compelled to use. 3. It has cut us out of our trade in those regions, and will compel us to close our works if the advance continues. Coal is a large item with us and we have gotten to the end of our string. We cannot stand any further advance. If it continues, must close until matters are settled.

Another Philadelphia hardware and malleable iron maker writes:

We had a supply of iron and a fair supply of coal when the coal strike commenced, but, fearing a long and stubborn fight, we went into the market and bought from retail dealers all the coal we could get in our neighborhood, costing us from \$1 to \$2 per ton higher than we had been paying before the strike. We are that much worse off, as we do not get it back again. Other than this we have not felt the strike as yet, but believe we must soon notice a falling off in our orders if the strike continues many months longer.

R. D. Wood & Co., manufacturers of cast-iron pipe, hydrants, machinery, &c., Philadelphia, say that the strike has had practically little effect upon their business, having supplied themselves with all the hard coal they required before it started in. It has had an indirect influence, they state, through the hesitancy of companies to sell iron freely and for long dates ahead,

but they have had no trouble in purchasing all they desired.

Mellert Foundry and Machine Company, Limited, Manufacturers of Cast-Iron Pipe, &c., Reading, Pa., say:

We were running but one of our shops since the commencement of the strike in the coal regions here and were compelled to use coke in our cupolas instead of coal, and had considerable trouble in running our heats successfully at first; however, we are beginning to do reasonably well with coke. We would have experienced no trouble had our cupolas been constructed more favorably for the use of coke. Coke with us is more expensive than coal at prices ruling before the strike. We are paying now about twice the amount we paid for coal before the strike. We consider the strike a nuisance and trust it will be abated shortly.

The Jackson & Woodin Mfg. Company, manufacturers of car-wheels, cars, cast iron water and gas pipe and special castings, Berwick, Pa., state that so far the anthracite coal strike has caused them very little inconvenience. If, however, it was to continue for any length of time, they think it would very seriously affect them, as they get a considerable quantity of pig iron from the Lehigh. In melting iron they say that they use part coke and Wyoming coal.

The Goulds Mfg. Company, iron and metal pumps, Seneca Falls, N. Y., say:

It has been quite disastrous to us for contracts that we had made with firms in Pennsylvania from whom we had been purchasing iron. We are advised they are unable to carry out their contracts on account of their inability to obtain coal. We require a strong and fluid iron in our business, and have confined ourselves to certain brands of iron for many years on this account. We have been compelled therefore to shut down our furnaces for a few days until we can obtain our supplies from other localities.

A New Jersey lock and hardware manufacturer writes as follows: "We have had no difficulty as yet in getting anthracite pig iron of the brands we use. The only influence on our business that the coal strike has had is to make us pay more money for the anthracite coal we use, which, of course, adds to expense of doing business or manufacturing our goods."

P. & F. Corbin, manufacturers of hardware, New Britain, Conn., state that they have not, up to the present time, been affected in any manner by the strike.

The New England Butt Company, H. N. Fenner, treasurer, Providence, R. I., write: "We do not think the strike in the coal region has had any material effect upon our business, excepting to increase the cost of lump coal \$1.25 per ton. It forced us to change to a different brand of coal, but we get just as good results from one as the other."

The Builders' Iron Foundry, R. A. Robertson, Jr., treasurer, Providence, R. I., write: "We have had no trouble so far from results of strike. If strike continues, Southern iron will come to this market in greater quantities than at present, without material advance in price."

The correspondent of the *Diario de Barcelona* writes from Buenos Ayres, under date of December 8, that the census of November last shows the population of the latter to be 477,000. In November 51 steamers landed 16,086 immigrants from Europe, as compared with 35 steamers bringing 10,739 in November, 1886. During the first 11 months of last year there arrived 97,631 immigrants, against 93,116 during the corresponding period of the previous year, and 20,000 additional were due in December last. Real estate speculation was rampant; some unimproved property brought eight times its cost 18 months previous. *La Nacion*, in an editorial dated November 26, attacks the Congress of 1887 on account of voting the budget for 1888 with \$85,036,469 for ex-

Advances on Appraisement and Reappraisement of Invoices,

INCLUDING METAL, IRON, STEEL AND MANUFACTURES.

BOSTON.

Date of invoice.	Date of appraisement.	Date of reappraisement.	Description of Merchandise.	Quantity.	Value per ton or kg.	Additions by importer on entry.	Value on appraisement.	Value on reappraisement.	Average advance on reappraisement over entered val.
1887.	1887.	1887.							
Jan. 8 ...	Feb. 7....	March 11.	Steel plate scrap cuttings.....	12,92.0	60/ per ton.	.....	£41. 3/4	£41. 3/4	10 %
Feb. 28...	April 12..	May 3....	5,949 Bessemer steel billets.....	256.8.3.5	£3. 18/10 per ton.	.....	£1,170.0/1	£1,081.6/5	6.98 %
Feb. 1....	March 7....	March 21.	Calking steel.....	8.0.0.0	£17. 3/0 per ton.	.....	138.0.0	133.17.3	1/2 %
					Marks per 1 000 kg		Marks.		
March 31.	April 23..	.....	Bessemer steel fence wire rods.....	121,920	90.75	1,249.72	12,313.92	.....	.....
March 25.	April 23..	.....	Bessemer steel fence wire rods.....	40,640	94.00	284.49	4,104.64	.....	.....
April 4....	April 23..	.....	Bessemer steel fence wire rods.....	182,700	92.50	1,552.95	18,452.70	.....	.....
April 1....	April 23..	.....	Bessemer steel fence wire rods.....	300,000	92.50	2,550.00	30,300.00	.....	.....
April 12...	May 2....	.....	2,192 bdls. Bessemer steel fence wire rods	60,960	90.00	716.25	6,248.40	.....	.....
April 9....	May 2....	.....	9,647 bdls. Bessemer steel fence wire rods	300,000	92.05	300,000	30,750.00	.....	.....
April 9....	May 2....	.....	1,222 bdls. Bessemer steel fence wire rods	39,820	95.00	298.65	4,081.55	.....	.....
April 9....	May 2....	.....	bdls. Bessemer steel fence wire rods	64,315	95.00	482.33	6,502.28	.....	.....
May 10....	May 31....	.....	bdls. Bessemer steel fence wire rods	60,960	99.11	54.25	6,096.00	.....	.....
May 7....	June 20...	.....	8,561 steel billets.....	402,695	70.74	688.61	29,175.25	.....	.....
May 11....	June 11....	.....	steel billets.....	484,869	80.58 per 1015 kg	.....	34,720.48+	.....	.....
May 9....	May 31....	.....	steel bars.....	101,325	84.00	.....	7,745.28+	.....	.....
June 11....	July 12....	.....	225 bdls. strip steel.....	314.1.10	12/9 per cwt.	£13.15/5	214.3.1	.....	.....

* Entered value, £13. 1/8.

+ Addition of 559.32 by appraisers 2 1/2 % discount and charges.

‡ Addition by appraisers, 14.18, 2 1/2 % discount and charges.

ST. LOUIS.

Date of invoice.	Date of appraisement.	Description of merchandise.	Weight in pounds.	Total invoice value.	Total appraised value.	Additions made by importers.	Additions made by appraisers.	Remarks.
1887.	1887.							Average advance per ton.
Jan. 19.	March 7.	9,433 bundles cotton ties.	480,286	5,738	5,842	.....	104	Two shillings per ton added,
Feb. 2.	March 31.	21,824 bundles cotton ties.	1,111,040	13,396	13,636	.....	240	making an average value per
Jan. 19.	March 23.	12,320 bundles cotton ties.	627,200	7,494	7,632	.....	138	ton of £5. 12/ at works.
Jan. 27.	March 23	4,849 blooms.	2,990,415	21,882	22,692	810	.....	2/6 per ton added.
Jan. 21.	April 30.	2,461 blooms.	1,459,332	9,907	10,868	961	.....	6/ per ton added.
Feb. 25.	April 30.	1,261 blooms.	952,214	5,053	5,543	490	.....	6/ per ton added.
March 4.	June 10.	4,920 blooms.	3,129,144	22,881	23,728	847	.....	2/ per ton added.

CLEVELAND.

Date of export.	Date of entry.	Description of merchandise.	Quantity.	Invoice price per unit of weight, tale or measure.	Total invoice value.	Additions made by importers.	Remarks.
1887.	1887.						
March 31....	June 16....	6,067 steel bars	1,314,708	10.436	10,980	544	Importer adds per 1,000 kg.
May 10.....	July 14....	3,691 steel bars	784,500	6.079	6,416	337	6 marks
March 9.....	June 12....	8,786 steel bars	1,775,305	13.725	14,517	792	6 marks less 1 1/2 % Making market price
June 13.....	July 18....	1,156 bars of steel under 4 1/2	89,565	1.064	1,064	...	6 marks less 1 1/2 % 77 shillings per ton.
							Making market value
January 31..	March 28....	4,259 bdls. Bessemer steel fence rods.	311,930	3.138	3,172	34	1.00 mark, 94.00 marks per 1,000 kg.
January 31..	March 28....	7,227 bdls. Bessemer steel fence rods.	447,997	4.605	4,653	48	1.00 mark, 96.00 marks per 1,000 kg.
January 31..	March 28....	12,512 bdls. Bessemer steel fence rods.	660,556	6.549	6,954	405	7.00 francs, 120.00 francs per 1,000 kg.
February 25.	April 30....	9,085 bdls. Bessemer steel fence rods.	673,193	7.166	7,210	44	6.00 marks, 99.00 marks per 1,000 kg.
February 25.	April 30....	10,269 bdls. Bessemer steel fence rods.	603,161	6.134	6,297	163	2.50 marks, 96.50 marks per 1,000 kg.
February 25.	April 30....	8,984 bdls. Bessemer steel fence rods.	535,920	5.363	5,696	333	5.75 marks, 98.75 marks per 1,000 kg.
February 25.	April 30....	11,635 bdls. Bessemer steel fence rods.	670,560	6.870	7,037	167	2.50 marks, 97.00 marks per 1,000 kg.
February 25.	April 30....	3,581 bdls. Bessemer steel fence rods.	223,300	2.210	2,367	157	6.50 marks, 98.00 marks per 1,000 kg.
January 27..	May 16....	13,577 bdls. Bessemer steel fence rods.	782,320	7.980	8,125	145	6.00 marks, 96.00 marks per 1,000 kg.
January 31..	May 16....	4,746 bdls. Bessemer steel fence rods.	550,000	5.776	5,803	27	55-100 m/k, 96.00 marks per 1,000 kg.
March 31....	May 31....	8,031 bdls. Bessemer steel fence rods.	615,886	5.743	6,196	453	7 1/2 marks, 102 1/2 marks per 1,000 kg.
March 31....	May 31....	14,778 bdls. Bessemer steel fence rods.	1,004,242	11.343	12,249	896	5 1/2 marks, 102 1/2 marks per 1,000 kg.
May 10.....	June 30....	4,759 bdls. Bessemer steel fence rods.	277,288	3.150	3,150	...	.....
May 10.....	June 30....	7,841 bdls. Bessemer steel fence rods.	558,800	5.789	6,045	256	7.38 marks, 100.00 marks per 1,000 kg.
May 10.....	June 30....	7,066 bdls. Bessemer steel fence rods.	675,033	6.938	7,303	365	5.00 marks, 100.00 marks per 1,000 kg.
May 10.....	June 30....	3,567 bdls. Bessemer steel fence rods.	223,500	2.321	2,418	97	4.00 marks, 100.00 marks per 1,000 kg.

penses, while the income is estimated not to yield over \$52,000,000. The budget provided \$52,683,088 ordinary expenditure, but the following amounts have been added: Special appropriations, \$22,496,761; \$15,000 for two months' salaries to employees of the Chamber of Deputies; \$9,435,900 interest guaranteed railroads; and \$405,720 interest guaranteed steamship lines. The Senate declined to authorize concessions granted to eight new railroad lines representing a total length of 4390 km. and a total cost of \$98,257,000, for which State aid is asked in the shape of an

interest guarantee involving the sum of \$4,912,880 annually. During the first nine months the import of merchandise was \$83,506,515, against \$72,806,346 in 1886, whereas the export was \$63,844,390, against \$56,674,157. The gold premium rose in November from 146 1/2 to 152; on December 7 it was 147.

The New York solvent savings banks have made returns for the past year to the Superintendent of Banking. Fourteen of these show greater deposits than withdrawals, while eight had amounts exceed-

ing the deposits withdrawn. In the former the deposits over the withdrawals reaches \$4,934,000, while in the latter the sums withdrawn exceed the deposits by \$1,511,500. This would give nearly \$3,500,000 net increase in the savings, and indicate that the times have been fairly good. The total for 1887 shows deposits amounting to \$81,448,762, against \$70,236,943 in the previous year. The greatest increase was in the Emigrant Industrial, where deposits amounted to \$12,663,000. The Bank for Savings, Bowery and German averaged about \$8,500,000,

Labor Troubles at Pittsburgh.

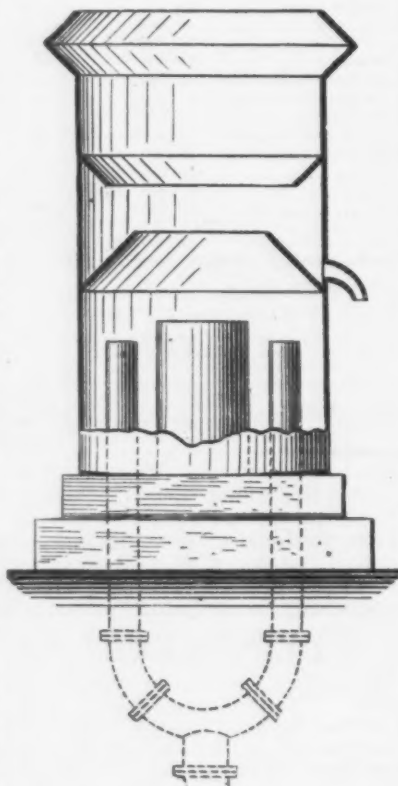
In our issue of last week we made mention of the fact that operations had been resumed at the Solar Iron Works of Wm. Clark's Son & Co., at Pittsburgh, with non-union men. It will be remembered that about the middle of December last these works were compelled to close down on account of the refusal of the owner to discharge one of their rollers, who had charge of two sets of rolls in the mill. This, according to the rules of the Amalgamated Association, is a violation of the scale agreement, which prohibits one man from having more than one position in a mill controlled by that organization. When the demand was made that he be discharged or else give up the management of one set of rolls, it was at once refused. As the shut-down occurred at a season of the year when improvements are made, the owners embraced the opportunity to make repairs to the plant, and when they were completed announced that all workmen who desired to return to their positions were at liberty to do so, but not as members of the Amalgamated Association, as they would in the future refuse employment to any person who belonged to this organization. This announcement had the effect of causing ill feeling between the former employees and the firm. On the morning of the 3d inst. operations were commenced with non-union men, the majority of whom are colored men. As soon as it became known to the strikers that their places had been filled, they gathered in large numbers at the various entrances to the works and threats were made against the men at work. The proprietors fearing trouble summoned a number of special policemen who escorted the men to their homes at the close of their day's work. On Saturday, the 4th inst., the same tactics were employed, but the strikers were so enraged that they attacked the colored men and for a time it seemed as if a riot would take place. Shots were exchanged and missiles were thrown at the workmen, with the result that two or three of the attacking party were seriously, but not fatally, injured. This was the worst encounter that has taken place, although several of the workmen were attacked on Monday of last week, but not injured. The proprietors have gone to the expense of hiring 20 extra policemen to guard their works, and announce their intention of making a thorough investigation of the trouble and will punish those who caused it to the full extent of the law. At this writing, the works are in full operation and everything is quiet. This is the first serious labor trouble that has occurred at Pittsburgh for a long time, and is greatly to be deplored. While we think it would be unfair to charge the Amalgamated Association with being the cause of the trouble, we think that they are partly to blame for it. The men who started the trouble are members of this organization, and should have staid away from the works if they did not intend to accept the proposition made to them by the firm and go to work. It is a recognized fact that every man has a right to sell his labor for the highest price that he can get for it, and it is also a recognized fact that he has no right to interfere or molest a man that takes his position when he willingly surrenders it. The sooner the members of the Amalgamated Association learn this and practice it the better it will be for them. Such actions as they have indulged in have a tendency to bring into disrepute the standing of any organization, no matter how high it may be. We do not believe that the doctrine of the Amalgamated Association teaches its members to commit acts of this kind, and that if those guilty of causing the disturbance are signaled out and expelled

from its ranks that the association will, in a measure, regain what they have lost by the action of their hot-headed and unruly members. We trust it will be a long time before such scenes are again witnessed in Pittsburgh or anywhere else.

The Haas Chimney Top.

Mr. Wm. Haas, 57 Grand street, New York, is putting on the market a very simple form of chimney top for steam boiler furnaces, principally designed for improving insufficient draft by moderate steam blast. The engraving which we annex explains the whole arrangement, and virtually speaks for itself.

The end of the chimney proper is furnished with a short section of glazed earthenware pipe, at both sides of which



Boiler Furnace Chimney Top, Made by Wm. Haas, New York.

are two slightly shorter pipes branching off, in the manner shown, from the exhaust-pipe of the engine. The whole is within a sheet-iron cylinder fitted just above the chimney-pipe with a conical ring designed for catching the water of condensation. A second and similar, though inverted, ring is provided further up, and is so proportioned that the condensed steam at that height is led back to the space between the sides of the lower ring and the cylinder in which it is fixed. The entrance of exhaust steam from the two branch pipes thus performs all the functions of a steam blast, and the formation of a partial vacuum through condensation further promotes the draft. The accumulated water of condensation finds a ready exit through the opening left at one side. The top of the chimney being formed of a pipe of glazed earthenware, as we have explained, does not suffer from the presence of water. The device appears to be well adapted to furnaces with insufficient chimney power, and, we are told, has already been successfully applied in a number of cases. We should add here that where sufficient draft cannot be obtained by working the device with exhaust steam, live steam may be introduced to advantage.

Large Shipments of Copper.

The eagerness of Lake Superior copper producers to make hay while the sun shines is shown by the promptness with which they ship copper to market. The *Houghton Mining Gazette* prints the following figures:

The shipments of refined copper during the month of January over the D. S. S. and A. Railway were as follows: Calumet and Hecla, 106 cars, each containing 20 barrels of 1250 pounds, or a total of 25,000 pounds per car; Tamarack, 41 cars; Quincy, 22; Osceola, 15; Atlantic, 12; Franklin, 11; Central, 9; Huron, 7. Total, 223 cars, or 5,575,000 pounds. The total rail shipments in December, beginning with the 7th day of the month, were 189 cars. The January shipments, divided into weeks, were for the first, second, third and fourth weeks respectively, 46, 52, 54 and 71 cars. The largest shipments in one day were on December 16, 17 cars, and on January 12, 15 cars. The largest in one week was for the week ending December 17, 80 cars. The shipments for the four days in February ending with last Saturday were as follows: Calumet and Hecla, 15 cars; Quincy, 9; Tamarack, 6; Osceola, 4; Atlantic, 4; Franklin, 3; Huron, 3. Total, 44 cars. Although the Calumet and Hecla is now producing about 800 tons less mineral per month than was the case last winter, yet as many smelting furnaces are in operation now as were active during that period. At present eight furnaces are at work at Hancock and eight at Lake Linden; last year the latter works had not been completed, and 16 furnaces were run at Hancock. The increase in the output of the other mines, however, hardly makes up for the decrease in the Calumet and Hecla on account of the fire. The output of all the mines, because of the high price, is now hurried to the smelting works, while last year it was sometimes allowed to accumulate at the stamp mills.

The Interstate convention of operators and miners of railroad coke, after being in session in Pittsburgh for nearly a week, have decided upon the same rate of wages paid last year, which, in the Pittsburgh district, is 74 cents per ton from May to November, and from November to May, 1889, will be 79 cents per ton. The next meeting of the convention will be held on the first Tuesday of February, 1889, at Indianapolis, Ind.

Capt. W. R. Jones has been appointed general superintendent of the Homestead Steel Works, of Carnegie, Phipps & Co., Limited, at Homestead, Pa. He is also general superintendent of the Edgar Thomson Steel Works, at Braddock, Pa.

Several large structures are about to be erected in Philadelphia. The Girard Life Insurance Building will have a stone front, 100 feet on Chestnut street and be eight stories high; of fire-proof materials throughout. The corner tower will be 180 feet to the apex. J. E. & A. L. Pennock are the contractors. Plans for Wm. M. Singerly's buildings on Chestnut street provide for a front of red granite and Indiana limestone, rock faced. The entire structure will be fire-proof and cost \$300,000. The central portion is for the occupancy of the Union Trust Company. The German Society's new hall will have a cornice of cast zinc and galvanized iron, and the balustrade and other ornaments will be of the same material. The cupola, 25 feet in diameter, will be of iron and glass. A double store of a very substantial character, the first two stories of iron, will be erected on Market street for William Weightman at a cost of \$300,000.

MANUFACTURING.

Iron and Steel.

On the 9th inst. Carnegie Brothers & Co., Limited, proprietors of the Edgar Thomson Steel Works, at Braddock, Pa., through their general superintendent, Wm. R. Jones, notified their employees of a 10 per cent. reduction in wages, to take effect when the works commence operations. A meeting of the workmen was held on Saturday evening, the 11th inst., and it was resolved to resist the proposed reduction. A committee was also appointed to notify the firm of this action. It is expected that the matter will be amicably arranged and that the works, which have been idle for some time, will commence operations in the near future.

The Findlay Iron and Steel Company, of Findlay, Ohio, started their new rolling mill for the first time on the 10th ult., and now have it in full operation in every department. Their product is exclusively merchant bar iron. The company now consist of practical iron manufacturers, who purchased the plant from the builders in December last, and who have the requisite capital and knowledge to operate it.

One of the most important transactions that has occurred in the manufacturing interests of Pittsburgh for a long time took place last week, and the papers were signed on Monday, the 13th inst. It will be remembered by our readers that in the early part of last year mention was made in these columns of the completion of the extensive steel plant of the Duquesne Steel Company, located at Duquesne, on the Pittsburgh, Virginia and Charleston Railroad, about 30 miles from Pittsburgh. It was one of the most complete Bessemer steel plants in this country, containing two 6-ton converters, and fitted up with the latest improved machinery. It was the intention of the company to engage exclusively in the manufacture of Bessemer steel blooms, billets and slabs. The contract for the erection of the plant called for its completion on December 1, 1886, but owing to the failure of the contractors to complete the works in the specified time it was not ready to commence operations till May, 1887. At this date, owing to the severe decline of the Bessemer steel market, it was deemed better by the owners of the plant to allow it to remain idle than to commence operations in the face of a declining market and run the risk of losing money. For this reason the plant has never turned a wheel. For some months the owners of the plant have been endeavoring to form a new company to take hold of it and operate it as a rail mill, with the result that a syndicate of Pittsburgh capitalists have been formed, who have purchased the entire plant at a consideration, which has not been made public. A charter of incorporation has been applied for under the name of the Allegheny Bessemer Steel Company. The incorporators' names mentioned in the application are E. L. Clark, of the Solar Iron Works, H. P. Smith, lately with Carnegie, Phipps & Co., Limited, W. G. and D. E. Park, of the Black Diamond Steel Works, George Boulton, formerly president of the Duquesne Steel Company, and Robert B. Brown, formerly vice-president of the company. In addition to the aboved-named gentlemen, who are all prominently engaged in the steel business in Pittsburgh, there will be a number of others connected with the new company, whose names are not known at present. The company will not be limited, but will be a corporate body. As soon as the charter is secured the stockholders will meet, elect officers and begin work. Plans are now being drawn up to build in connection with the plant a large rail mill, 850 feet by 70 feet in dimensions. It will be

supplied with all modern improvements. It is expected that the output will be from 16,000 to 18,000 tons of rails per month, and employment will be given to about 750 men.

The nail department of the Riverside Iron Works, of Wheeling, W. Va., has resumed operations. This factory contains 224 nail machines, and is the largest in the world.

Hansell, Elcock & Co. have taken the old Cook foundry, on Butler street, near Archer avenue, Chicago, and will start operations shortly on architectural iron-work. The members of the firm are practical men, and have had long experience in this branch of the iron trade.

The rolling mill of the Britton Iron and Steel Company, of Cleveland, which was destroyed by fire recently, will be immediately rebuilt. The new mill will be a duplicate of the old one, and will be equipped with two sheet mills, a bar mill and a plate mill. There will be five heating, four puddling and eight knobbling furnaces and a battery of five boilers in the building. In addition to these the mill will have a squeezer, a steam hammer, top and bottom rolls, six shears, a Baker blower and 10 engines. Much of the old machinery can be restored, but operations can hardly be resumed before May 1.

The blast furnace plant of the Bellefonte Furnace Company, which is located near the suburbs of Bellefonte, Pa., was completed the beginning of last month, and the furnace went into blast on January 30th. The company was chartered in April, 1887, with a capital stock of \$150,000, the directors being Hon. John Reilly and James P. Scott, of Philadelphia; J. King McLanahan, of Hollidaysburg; and Philip and Thomas Collins, of Edensburg, Mr. Reilly being president of the company. Brown hematite ore is obtained from mines situated about 19 miles from Bellefonte, containing a large percentage of iron, with very little silica and phosphorus. It is brought to the furnace over the Buffalo Run, Bellefonte, and Bald Eagle Railroad. This railroad was projected by the Collins Brothers some three years ago, being in a measure a private enterprise of their own, having for its original purpose the transportation to market of the rich iron ores with which the adjacent country is so abundantly supplied. The construction of the furnace, the idea of which was conceived by Mr. Thomas Collins, was commenced on March 27, 1887, Taws & Hartman, the blast furnace engineers, of Philadelphia, having the work in charge. It is 70 feet high and 15 feet in diameter at the bosh, with three improved Whitwell hot-blast stoves, and has an annual capacity of 35,000 tons. Connellsville coke is used for fuel. The company have their main office in the Bullitt Building, 139 South Fourth street, Philadelphia.—*Bulletin.*

The annual meeting of the stockholders of the Crane Iron Company, of Catsauqua, Pa., was held on Thursday, the 9th inst. The following officers were elected: President, Samuel Dickson; vice-president, George T. Barns; secretary and treasurer, W. S. Pilling; directors, Samuel Dickson, Fisher Hazard, Charles E. Haven, Chas. S. Wurtz, Henry Winsor, Lemuel Coffin, Alexander Biddle, Samuel R. Shipley, George M. Troutman, George T. Barns.

The Robeson Iron Company, Limited, at Robeson, Berks County, Pa., are operating their furnace entirely with coke on account of being unable to obtain a supply of anthracite coke.

A dispatch from Marion, Ind., under date of the 10th inst., reads as follows: "Today a Pennsylvania syndicate, in which are five large Eastern manufacturers, closed

the purchase of 500 acres of land lying south of and close to the city limits. The syndicate proposes to locate upon this land manufactures that will employ 3000 hands. By the terms of the contract of sale the purchasers are bound to locate upon the land five manufactories, working 1500 hands. Thirteen other manufactories were recently similarly secured."

The general manager of the furnaces of Robert Hare-Powel's Sons & Co., at Saxton, Pa., has received orders to put the works in operation at once. The works were closed on January 1, owing to the refusal of the men to accept a reduction in their wages of 10 per cent. The employees will go to work at the reduction, with the promise of a raise in two months. It is thought that all the men will be at work on the 15th.

The Indianapolis Rolling Mill Company, of Indianapolis, Ind., have been awarded a contract to furnish 1000 tons of steel rails, 60 pounds to the yard, to the Chattanooga, Rome and Columbus Railroad.

The Greencastle Iron and Nail Company, of Greencastle, Ind., have definitely decided to remove their works to some location where natural gas is available, but have not as yet decided on a location. The citizens of Muncie, in that State, have offered the company ten acres of land, a gas well and \$25,000 in cash to secure the plant. The offer has not yet been accepted.

The Pottsville Iron and Steel Company, of Pottsville, Pa., have announced a reduction of 10 per cent. in all wages, to take effect on the 15th inst.

A conference of creditors of Brown, Bonnell & Co., of Youngstown, Ohio, was held in that city on the 9th inst. It was stated at the meeting that the management of the plant under the receiver, Fayette Brown, has been satisfactory. Among those in attendance were George A. Berry and William McCreery, of Pittsburgh; Joseph Forker and M. Zahmser, of Sharon, and Judge Ewing, of Uniontown, Pa.

The Sligo Furnace Company made last year, in 340 working days, 15,800 gross tons of pig iron. This was at the rate of 46½ tons per day.—*Age of Steel, St. Louis.*

At the annual meeting of the Roane Iron Company, of Chattanooga, the following board of directors was elected for the ensuing year: A. L. Forsyth, W. E. Osgood, M. C. Younglove, J. E. Line, H. S. Chamberlain, D. E. Rees, Abram S. Hewitt, C. W. Vinson, C. M. McGhee, S. A. Key and T. G. Montague.

Articles of incorporation of the Newport Iron and Steel Works, of Newport, Ky., have been filed. The incorporators are H. A. Schriver, Adam Wagner, Al. Gahr, James Matthews and R. W. Nelson. The capital stock is \$500,000, divided into \$100 shares. The above is the company that will in the future operate the Swifts Iron and Steel Works at Newport, Ky., which have been idle for some months on account of the failure of E. L. Harper, of Fidelity Bank fame, who was president of the concern. A majority of the stock is held by Henry Schriver.

Articles of incorporation have been filed by the John O'Brien Boiler Works Mfg. Company, of St. Louis, with a capital stock of \$100,000, all paid. John O'Brien has 985 shares, and Newton B. Stewart, William Flottman and P. J. Madden five shares each.

The work of boring the cast-steel gun at the works of the Pittsburgh Steel Casting Company, at Pittsburgh, is progressing most favorably. On the evening of the 10th inst. it had been bored to the depth of 108 inches. Not a flaw has yet been found. The steel in the center of the cast presents the same character as when the work was

begun. As the work of boring proceeds it is watched with the greatest care by Mr. Wm. Hainsworth, its inventor, and also by the inspector sent to Pittsburgh for that purpose. At the present rate at which it is being bored it is thought it will be completed the present week. It will then be sent to Washington to be rifled by the Government, and then to Annapolis for the final test.

By an error we stated in a recent issue that Emma Furnace, of the Union Rolling Mill Company, Cleveland, had gone out of blast for three months. Mr. S. A. Fuller, general manager, informs us that Emma Furnace will be in blast again in two weeks.

The annual meeting of the stockholders of the Berlin Iron Bridge Company, of East Berlin, Conn., was held recently. The annual report showed that the past year had been very satisfactory, showing the largest profit of any year since the organization of the company. They have contracts enough on hand to run their entire plant 24 hours a day until spring, and are now running day and night with two sets of hands—and this is what is usually considered the dull season for the bridge business. They built over 200 spans of iron bridges last year, besides doing over \$100,000 worth of other iron-work. The newly elected officers are: Charles M. Jarvis, president and chief engineer; B. K. Field, vice-president and treasurer; George H. Sage, secretary.

Machinery.

The Leechburg Foundry and Machine Company, with works at Leechburg, Pa., and whose office is at 130 First avenue, Pittsburgh, have just closed a contract for the purchase of one large lathe which will turn out a piece 16 feet long between centers and 60 inches in diameter on inside face plate and will turn 25 feet in diameter on outside face-plate. It will be placed in the company's works in about 60 days. The company have also contracted for one 6-foot planer to plane 20 feet in length, which will be erected about the same time. They have just completed their air furnace and are now placing their 30-ton crane in position; also a battery of boilers, each of which will be 26 feet long and 22 inches in diameter. They will be ready in the course of a short time to cast rolls of any size required. The following are the officers of the company: W. A. Cochran, president; George Mesta, vice-president, and R. R. Moore, secretary and treasurer.

E. P. Allis & Co., of Milwaukee, recently received an order from the Joliet Steel Company, of Joliet, Ill., for an 1800 horse-power compound Reynolds-Corliss engine for the new wire rod mill which the latter are building. The same firm are also at work on a large blowing engine for the Bessemer steel works of the Springfield Iron Company, of Springfield, Ill., and two Reynolds-Corliss engines for the Milwaukee Cement Company.

Arrangements were perfected on the 9th inst. whereby, for a donation of \$50,000 and 7 acres of land, the McLeod Railroad Air Signal Company, of Boston, will remove their works to Canton, Ohio, at once. The erection of the buildings will begin immediately, and by the 1st of July it is expected to have 200 men at work.

Messrs. Malmédie & Co., of Duesseldorf-Oberbilk, Germany, makers of wire nail machines, have issued a circular dated January 27, 1888, in which they announce that they have transferred their agency from Mr. L. Hensheim to Messrs. Dago J. Thomas & Co., 1 Broadway, New York.

Hardware.

The affairs of the late firm of Merston & Bancroft, wire merchants, of Chicago, who recently failed, are rapidly progressing toward a satisfactory settlement. In the

meantime the members of the late firm are conducting an agency business at 214 Lake street. The Grant Wire and Spring Company's works, at Lockport, in which Merston & Bancroft were heavily interested, are partly in operation under their new owners, Stewart & Co., of Easton, Pa.

Rick Bros., Reading, Pa., are not manufacturing tacks at present, their factory having been closed for more than a year. The low figures at which tacks are selling is the reason for their discontinuing the manufacture.

The Capitol Mfg. Company, Loomis and Taylor streets, Chicago, manufacturers of the Acme wrench, are building up a large trade in that specialty, and are increasing their facilities for production. They expect shortly to be able to turn out 100 dozen wrenches daily.

The Economy Signal Sad Iron Company, 1293 Broadway, New York, are manufacturing Murdock's Patent Signal sad iron, an article which embodies some new features.

The South Bend Toy Mfg. Company, whose works at South Bend, Ind., were burned on December 29, have almost completed their new building, and expect to have the factory running by the 15th inst., when they will push work rapidly in their regular line of croquet, ball bats and children's wagons. They will add no new goods this season, having all they can do to supply their customers with their usual line.

Miscellaneous.

The storage business in Pittsburgh is said to be increasing rapidly. A meeting of the stockholders and directors of the Union Storage Company, of that city, has been called for the first week of March to consider the advisability of increasing their capital stock, and make arrangements to meet the demands of their increasing business. It is proposed to extend their warehouse at Twenty-fourth and Railroad streets very materially, but plans will not be adopted until after the meeting of the stockholders.

A license to incorporate has been issued to Henry Sears & Co., of Chicago, for the manufacture of cutlery; capital, \$50,000; incorporators, Edmund B. Sears, John E. McWilliams and Frank W. Bailey. The Olund Mfg. Company have been incorporated at Chicago, with a capital of \$500,000, to manufacture barrel machinery, tools and appliances. Incorporators are Byron D. West, B. Beckley Hamlin and Harrison J. Baker. The Chicago Wire and Spring Company have also been incorporated with a capital of \$75,000 by Fred. M. Reynolds, D. H. Campbell and George W. Hern. The Miller Hardware and Lumber Company have been incorporated at Alma Center, Wis., with a capital of \$50,000, by E. A. Miller, J. B. Miller and P. T. Graves.

Chicago manufacturers suffered considerably from the ravages of fire on the 9th inst. In the morning the three-story brick block, 41 to 47 South Canal street, occupied by a number of manufacturing concerns, was burned. It was owned by P. W. Gates, of the Gates Iron Works, and occupied by D. M. Swiney & Co., furniture manufacturers, and the P. Dreesback Mfg. Company, makers of gas fixtures. The losses were nearly covered by the insurance carried. In the evening the four-story brick building, 103 to 107 West Monroe street, was burned. Part of it was occupied by Winslow Bros. and part by E. T. Harris, both establishments manufacturing metal goods. The total loss is about \$60,000, the greater part of which is covered by insurance.

The Electrical Advertising Scale Company, of Waukegan, Ill., have elected the

following officers: H. Parkholder, president; J. M. G. Carter, vice-president; H. S. Clark, secretary; R. W. Coon, treasurer. Suitable quarters in which to manufacture the scales are to be purchased or erected without delay and work is to be pushed vigorously.

A license of incorporation has been secured for the Hazleton Tripod Boiler Company, of Chicago. The capital authorized is \$250,000, and the incorporators are Milton W. Hazleton, Charles Halleck and Charles B. Holmes.

The Baltimore and Ohio Railroad have made a contract with the Michigan Car Company, of Detroit, Mich., for the construction of 250 Wicks refrigerator cars, for the transportation of fresh meats and other perishable freight. Each car will cost from \$1500 to \$2000, making the total cost nearly \$500,000. The company have also begun the construction of 25 large locomotives at the Mount Clare shops, and will buy or contract for as many more. The new locomotives are to be what is known as the combination engine for heavy work.

The Philadelphia (Westinghouse) Natural Gas Company, of Pittsburgh, have declared their twenty-eighth dividend of 1 per cent.

A dispatch from Findlay, Ohio, under date of the 9th inst., says: "At a convention of 300 land-owners interested in properties in this vicinity the various syndicates to-day resolved to pool their issues and place one-tenth of their land, or its equivalent in money, into a common pool to use as bonuses in securing manufactories. This is in addition to what may be offered for special locations. The convention also voted to accept propositions from the Nickel-Plate and Cincinnati, Hamilton and Dayton railroads to extend their lines to this city, on condition that the right of way is granted."

The Detroit Water Commissioners contracted with the Detroit Pipe and Foundry Company for water-pipe to the value of \$82,000.

Articles of association were recently filed of the United States Scale Company, of Terre Haute, Ind. The capital stock is \$50,000, in shares of \$50 each. The stockholders are S. J. Austin, D. W. Minshall, Edith A. Gillette, Samuel Garvin, Harvey Boston, Louis Bear and Edward Weller, all of Terre Haute. The officers of the company have been elected as follows: S. J. Austin, president; Harvey Boston, secretary, and Samuel Garvin, general superintendent. The term of incorporation is 50 years. The change is merely taking the work out of the hands of the old company and placing it with the stock company, there being some additional capital invested and the employees admitted as stockholders. The intention is to run a general foundry and machine shop and manufacture the United States scales. There is talk of building a large addition on the lot west of the present works, but this has not been definitely decided on.

An extensive building for the manufacture of tinfoil is about to be erected in St. Louis, by James Johnson, formerly of the Missouri Lead Company. Large quantities of lead will be consumed to meet the increasing demand for tinfoil by tobacco manufacturers, brewers, &c.

The Consolidated Railway Telegraph Company, 13 Park Row, New York, have issued a neat catalogue describing their system of train telegraphy. It is illustrated with a number of engravings.

The 94 wooden bridges on the Southwest branch of the Pennsylvania Railroad will be replaced by iron structures during the coming spring.

The Iron Age

New York, Thursday, February 16, 1888.

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GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Since our last issue another meeting of the coke operators has been held for the purpose of endeavoring to complete the formation of the long-promised coke pool, but, like all previous meetings, nothing was done owing to the absence of some of the independent operators in the region. Another meeting has been called for Tuesday, the 21st inst., and it is supposed that unless some decided action is taken that this will be the last one. A number of the operators have expressed themselves as being very tired of attending meetings and doing nothing. It is now admitted that the prospect of a syndicate is decidedly gloomy. This is borne out by the announcement that H. C. Frick, the well-known operator and president of the H. C. Frick Coke Company, has left Pittsburgh and gone to Florida on a pleasure trip, and will be absent for some time. If the prospect for the formation of a pool were as bright as claimed, it is quite reasonable to suppose that Mr. Frick would remain at home to look after the interests of his company. The coke trade is reported to be very dull at present, and one or two works have closed down, awaiting an improvement. The shipments for the month of January were nearly 20 per cent. less than those of the previous month. The output for last month was 20,225 cars, as against 25,200 cars in December. These were distributed as follows: West of Pittsburgh, 13,600; east of Connellsville, 2500; Pittsburgh and rivers, 4125. The principal cause of the falling off in shipments is due to the continued idleness of the rail mills and the banking of three of the Edgar Thomson furnaces, the blowing out of two more, and the idleness of a number of furnaces in the Shenango and Mahoning valleys. It would be unreasonable to expect an improvement in this industry till a resumption of work at the idle plants takes place. It is also reliably reported that prices are beginning to decline, a number of smaller operators having sold coke at figures considerably less than the price fixed some time ago. The two days' shut-down agreement still continues, and with but few exceptions the coke plants are idle on Wednesday and Saturday of each week.

M. de Lesseps has been finally forced to acknowledge the impossibility of carrying through his sea-level canal at Panama within the time specified, and to adopt, as a preliminary measure, as his friends put it, the use of locks. Through the *Génie Civil* we are placed in a position to understand some of the leading general features of the scheme. Four locks are to be put in on the Atlantic end of the canal, at kilometers 22.7, 37.2, 43.8 and 46.3, the first two with Eiffel locks having a rise of 8 m., and the last two of 11 m. a total of nearly 120 feet. At the Pacific

Coast section there are to be three locks at kilometers 57.2 and 57.8 of 11 m. and 59.1 of 8 m., and an 11 m. lift at kilometer 61.8. Possibly closer study may cause two additional locks to be put in at the Emperador Culebra section. This woeful backdown will undoubtedly have a serious effect upon further financing on the part of the promoters, although thus far it has had no serious effect upon the quotations of the shares. Should the expected collapse come, it would profoundly shake the French business world, and might create a panic which would be keenly felt all over the world. It is not without the range of possibility, either, that trouble, if it did come, might seriously affect such undertakings as those in which the copper and tin syndicate is engaged in.

As an appendix to a monograph, issued by the Military Service Institution, entitled "Gun-Making in the United States," Capt. Rogers Birnie, U. S. A., shatters quite effectually the evidence brought forward in regard to failures in steel guns in a report adopted by the New York Chamber of Commerce of February 3d, 1887. Fourteen separate cases of alleged failures were cited. To each Captain Birnie attaches a counter statement giving the facts, so far as they are accessible, from the records of the office of Naval Intelligence. The 6-inch gun which burst on H. M. S. Active was not a modern steel gun, nor was the 12-inch gun of H. M. S. Collingwood, nor any of those used at the bombardment of Alexandria. The bursting of the gun on board H. M. S. Canada was due to a premature explosion of the charge, while the failure of the four guns of H. M. S. Ajax was simply due to a damaged vent. Captain Birnie denies that the failure of 100-ton Armstrong guns tells against steel, because they consist only of a comparatively thin steel tube reinforced by wrought-iron coils. The reports of failure of two 120-ton Krupp guns made for Italian coast defense, denied as they are by Krupp himself, are attributed to a rival firm, while the sweeping assertions of the collapse of Krupp guns during the Franco-Prussian war are met by the statement, emanating, it is true, from Krupp, that only 18 have failed out of 17,000 made between 1847 and 1878. Coming nearer home, Captain Birnie takes up the charge that "our 6-inch steel rifle at the Washington Navy Yard for the new cruiser was condemned for defects found in the bore upon final inspection, and that two out of five guns of the same class show similar defects in the bore." He states that but one gun was condemned for this cause, and that gun was taken apart in order to use the sound pieces in the construction of a new gun. It was charged that the new 8-inch steel rifle for the Ordnance Department made of Whitworth steel showed enlargement of the tube after 24 rounds, so that firing was suspended and the gun was taken to the machine shop to be reinforced by additional hoops. Captain Birnie states that this is an experimental gun; that the necessity of chase-hooping was anticipated before any firing was done; that the enlargement of the bore did not injure the gun, and that 76 rounds fired since the chase-hooping have been borne without revealing any defects.

Cutting the Bar Iron Card.

The decline in the price of bar iron has again brought the manufacturers to the disagreeable necessity of making concessions on extras. This has always been done whenever the base price of bar iron has been reduced to a profitless point. It would seem to be a very foolish thing to do, when the extras themselves do not indicate an absolute profit to their full extent, but are imposed to cover an extra cost of production over base sizes. Yet manufacturers will do it, and in doing it they lay themselves open to the imputation that the extras set forth in the card have not really been needed. But they do not make concessions on extras to all classes of customers. The large buyers are the ones specially favored. Small consumers, particularly those who buy from merchants, have to pay the full card. The card thus operates to the advantage of the merchant either in good times or in bad. It is unfortunate that manufacturers are not able always to participate in the benefits accruing from the use of their own card. This is their own fault, but one which they appear powerless to correct. The cutting of card rates which is now in progress therefore refers particularly to transactions of some importance and not to small sales. It is no secret that a flat price is being made by many mills on orders including sizes classified at an advance of $\frac{1}{16}$ cent above the base price, while it is charged that in some cases even more costly sizes have been thrown in by mills anxious to secure orders. For some time heavy buyers have been favored with a concession of half of the extras.

Quite a number of prominent manufacturers have been dissatisfied for a long time with the manner in which the list of extras has been made to play its part in the bar iron trade, and some of them have predicted that the time would surely come when most sizes, if not all, would be sold at a flat price, but the trade generally were unprepared to see a single manufacturer cut loose from his associates, and announce a radical change in the list of extras. Yet this step has been taken by a very prominent Western company, who issued on the 1st inst. a new classification, in which many of the extras were reduced one-half, while all the others were modified to suit the existing condition of trade. We print this new classification in our Metal Prices Current. Considerable of a sensation was created when this fact became generally known, and the company was severely criticised by numerous competitors, yet it had simply announced its intention to do openly what all of them had been doing privately. This action was not taken hastily, but after due deliberation, and with the intention of enabling all classes of its customers, particularly manufacturing consumers, to receive equally fair treatment with one another.

What action the Western Iron Association will take when this important deviation from their classification comes before them for consideration is difficult to forecast, but the matter can hardly be ignored by them, as the break has occurred in their own territory, and other manufacturers may follow the lead of the company making the new departure. The Eastern classification is also threatened by the free circulation in the East of the company's

announcement. A uniform classification is desirable for a great many reasons, and it would be very confusing if hereafter every mill should make a list of their own. The time seems to be at hand, however, when the old classifications must be modified in some way to suit new conditions of trade. Possibly this could most easily be secured by the adoption of a sliding scale of extras, so that they would uniformly increase or decrease with changes in the base price. This would be objected to on the ground of the increased clerical labor which would be required in making up accounts, but it would be better than the complete destruction of the card or the adoption of a separate card by every mill.

Effect of the Western Railroad War Upon Business.

The presumption was at once created, when the Western rate war broke out, that the low rates made would stimulate trade between points in the Northwest and the distributing and manufacturing centers further East, and merchants and manufacturers' agents hastened to acquaint their customers with the facts and to make preparations to supply their wants. Up to this time, however, there has been a remarkable hesitation among the purchasers of nails, iron, steel and hardware, to avail themselves of the opportunity to lay in stocks. It is true that the pig iron trade is of a character little affected by fluctuations in freight rates, but other branches of the iron trade are governed more or less by such influences, and it is a matter of some surprise that they are all comparatively quiet. For carload lots of nails, orders have perhaps increased from this cause, and possibly some other goods sold on correspondingly close margins have experienced an improved demand, but heavy buyers are holding off. In general hardware it would be difficult to determine what the effect has been, as the active trade now in progress in that line is merely what is expected at this season, and buyers may or may not be influenced in the size of their invoices by the low freight rates.

It is possible, indeed highly probable, that buyers generally are looking forward to the establishment of still lower rates before they conclude to place their orders. They are warranted in this conclusion by the action of the freight solicitors of the railroad companies, who are actively drumming up trade for their lines and are offering better terms almost from day to day. The Interstate Commerce act is also operating on the side of delay. Everybody knows that it is now impossible for the agents of the companies to meet and adjust their differences, patch up an agreement and advance freight rates in short order. Ten days' notice of such an intention must be given to the public. Therefore, no matter how low rates may go, nothing is lost to the buyer by waiting, as, if they do not happen to be put lower, he is sure of the very lowest rate for ten days.

Buyers, however, run some risk in waiting for the very lowest rates. Merchants and manufacturers may not be able to ship promptly if orders are delayed until within ten days of the restoration of rates, and railroad companies may not be willing to handle an enormous accumulation of freight if thrown upon them at unremunerative

rates. The Chicago agents of the most important lines are looking forward to a contingency of this character. The ordinary shipments, which are being held back until freight rates reach their lowest notch, added to the heavy trade which is almost assured as soon as it is known that rates are to be advanced, may cause a repetition of the car famine which has been experienced in various parts of the country during the busiest seasons of the past year.

The theory has been advanced that this freight war was inaugurated to deter paralleling schemes in the West, but this seems untenable, as the most important schemes of this kind which have been contemplated in recent years have all been consummated so far as the territory is concerned which is now the seat of war. The parallel lines having been built, there is nothing to be gained by a movement of this character. If, however, the war should continue long enough there is no doubt that some of the companies engaged in it will find themselves so badly crippled financially that they will be unable to make the extensions and build the branches in the far West which they have had in view. This would be a result of the war, but it is a far-fetched theory to name it as a cause. At the same time, too, the fact must be considered that under the provisions of the Interstate Commerce act it is hardly possible to prolong a railroad war now without incurring so heavy a loss as to make all parties concerned anxious for a speedy settlement. Local traffic can no longer be made to bear the burden of a contest over business between competitive points. When through rates are cut all intermediate rates must be lowered. The heavy decrease in earnings thus entailed must speedily bring railroad managers to a realizing sense of the necessity of an early termination of hostilities, but there can be little doubt that the outcome of the present struggle will be a permanent reduction of rates below those ruling previous to the great conflict now raging.

The Resources of South Australia.

South Australia runs from the north to the south in an almost straight line through the very center of the Australian Continent from the Gulf of Carpentaria to the great Australian bight. It is the largest British Colony, its area being more than 900,000 square miles. The population of the Colony at the close of 1885 was estimated to be 313,423. The inhabitants of the city of Adelaide number 43,969 persons, and with the suburbs 80,000. A poll tax of £30 is levied on every Chinese immigrant. There are 477 schools with 55,772 scholars. Eleven banking institutions carry on business within the colony; they have issued notes to the extent of £550,000 and had, on December 31, 1885, £5,881,221 deposits. Their establishments in the principal seaports and inland townships number altogether 146 branches and agencies. On the date named, the total average liabilities were £6,504,881 and the total average assets £12,380,722. The total number of depositors in the Government savings bank was at the time 55,204, the total deposits amounting to £1,653,080. The public debt amounts to £18,355,000. The revenue, in 1885, amounted to £3,399,591, and the expenditure to £2,454,808.

The climate, with the exception of a few localities, is all that Americans or Europeans could desire; it is a climate of blue skies, bright sunshine, and mild, genial weather, varied by sufficient rainfall and moisture in most years, and marked by an almost entire absence of those fierce commotions which elsewhere bring destruction and dismay. Hurricanes may be said to be unknown; fogs are rare; earthquakes, which have been occasionally noted, are confined to a few slight tremors. The coldest months are June, July and August, the mean monthly temperature of which are 54.4°, 51.5° and 53.7° respectively. About two-thirds of the total area of land cultivated is cropped with wheat, of which cereal 1,942,453 acres were reaped last year. The area of wheat grown has increased more than 100 per cent. during the last 10 years. Vine culture is an important and progressive industry. There are 4590 acres of land devoted to this purpose. The produce of these vineyards for the year ending December, 1884, was 473,535 gallons of wine—about 130 gallons per acre. The suitability of the soil and climate of South Australia to the growth of wine was discovered by the early settlers, some of whom had brought from Europe a variety of high-class vine cuttings. The slopes of the hills produce wines of a full-bodied character, similar to those of Spain and Portugal, while those in the more elevated districts resemble the lighter wines of the Rhine. While the local demand is fully supplied at very cheap rates, a considerable export trade in the wines of higher grade is carried on. The wines of South Australia have always been awarded prizes at the several great international exhibitions. Considerable attention has also been paid to the drying of raisins and currants. This branch of industry will probably soon develop into an export trade. Almond trees are of rapid growth, and large quantities of a superior description of soft-shell almonds are gathered yearly for home consumption and for shipment. South Australia possesses all the conditions requisite for the successful culture of the olive. Olive oil of the most delicate character has been pressed, and gained awards at the various exhibitions. Its purity and general superiority over the imported article of commerce has acquired for it a high position in the local market.

In 1851 the total area of land leased from the Crown for pastoral purposes was 15,000 square miles. Now no less than 226,130 square miles are leased. The number of horses has increased from 6500 to 168,420; of horned cattle, from 70,000 to 389,726; and of sheep, from 1,000,000 to 6,696,406; while the exports of wool have increased from 4000 to 186,617 bales. The combined import and export trade of 1885 amounted to £10,706,159, of which £5,289,014 were imports and £5,417,145 exports. Of the total imports, more than one-half—viz., £2,781,460—came from the United Kingdom. Of the total exports, products representing £3,331,087 were exported to the mother country. The total trade with foreign States only amounted to £524,421. It appears that out of £4,385,599 worth of staple produce exported the value of breadstuffs amounted to £2,187,057; that wool represented £1,671,775, and copper, £322,983. The total value of wool shipped in 1856 was £412,163; 1866, £990,163; and in 1884 it

reached £2,618,626. Port Darwin had in 1885 £146,708 imports and £97,555 exports, with a tonnage of vessels inward of £78,571, mostly from Hong Kong and the Australian ports. There are 4250 miles of road in the settled districts; the aggregate number of miles macadamized is 2012; the mileage of railroads open for traffic in the colony is 1063; and that of new lines in the course of construction, 718. Up to December 31, 1885, the total cost of railways reached £9,338,428. South Australia at her own risk erected a line of telegraph some 2200 miles in length, at the cost of £400,000, across a Continent that had only been traversed by an exploring party. At the close of 1885 there were 193 stations and 5346 miles of lines open throughout the colony, and there are several lines now in the course of construction. Internal water communication is afforded by the Murray River, on which steamers run for 2000 miles. There is regular and frequent communication by mail steamers with all parts of Australasia, as well as with Europe and San Francisco. The wheat crop now being gathered in South Australia is expected to yield over 10 bushels per acre, which would leave for export to Europe some 500,000 tons, and some 75 vessels have already been chartered at between 25/ and 30/ per ton. Considering the small population, it is truly wonderful what this colony is able to produce.

Causes Underlying the Western Railroad War.

Demoralized is the word applied by railroad men to the present condition of freight rates from Chicago to Missouri River cities on the west and to St. Paul and Minneapolis on the north. The printed tariff is no longer referred to. The present ruling rates are but one-half or one-third of the tariffs in force a month or two ago. Such a great reduction, of course, cannot be expected to be permanent, but it is pertinent to inquire whether there is any reason beyond mere caprice for the breaking of the tariff, and whether the old rates can be restored and held. The trouble seems to have begun in the North. For some time there have appeared signs of coming changes in the old basis of freight rates. The Northern Pacific and Manitoba made the same freight rate from the wheat fields to Duluth as to Minneapolis, abolishing a differential which this latter city had formerly received in spite of nearly equal distances from the sources of supply. For their own protection the far-sighted millers of Minneapolis had built a road into one of the wheat sections, and now pushed energetically forward a railroad from the milling metropolis to the Sault Ste. Marie, where connection was made with the Canadian Pacific, the two forming a line shorter, if anything, to Boston and but a little longer to New York than the old lines via Chicago. The opening of this "Soo" Line was the signal for a break in rates both on breadstuffs Eastward and merchandise Westward. When it is remembered that it is milling capital which built and controls this new line expressly for the protection of the city and business named, it does not seem likely that high rates will ever again be restored. The all-important fact in the rate situation

is of nature's fixing—Duluth is as near Buffalo by water as is Chicago, and must take the same lake rates. From this it follows that the roads from St. Paul to Chicago cannot in any case charge more than the roads from St. Paul to Duluth. It is here that the value of the Soo line is apparent; with this weapon in the hands of Minneapolis it is probable that Duluth (*i. e.* Chicago) rates will also be quoted between Minneapolis and the seaboard in the near future. A difficult problem is before the formerly prosperous railways between the twin cities and Chicago. It is inevitable that only very low rates can be charged hereafter, not only between the cities named, but also from all the Minnesota and Dakota points affected. It is understood that a strong effort is to be made to induce the trunk lines east of Chicago to share these low rates by pro-rating, and something of the kind may be the ultimate outcome.

The railroad war affects Kansas City traffic from Chicago as well as St. Paul. An extended and stubborn fight is sure to involve all related cities and traffics. Then again there may be traced a natural cause, and that is that the freight rates, as fixed in the old tariffs, were higher than warranted by the traffic. Comparing the Missouri River with the trunk line rates it may be roughly stated that for a distance a little over half the Missouri River rates were the same or higher, while the amount of business has been for years steadily increasing. Or to put it in figures, the average rate per ton per mile east of Chicago has been nearly half the average rate per ton per mile west of that city, while the density of the traffic has been but one-quarter greater, and this latter difference is being rapidly reduced as the Western States and Territories are settled. It follows from this that the old rates west of Chicago were relatively too high, and can be scaled down without injustice to security holders. As to these stocks and bonds, it should also be remembered that some of the prosperous roads have since 1880 given millions of dollars worth of additional stock to their stockholders without any payment therefor. Certain forms of railroad wars may be likened to bodily diseases; both are efforts of nature to reduce the systems, physical or corporal, to a normal condition.

The influence of these rate wars upon manufacturing and jobbing is subtle, but sometimes far reaching. Freight rates which are so high as to constitute in themselves a commercial profit have an undoubted tendency to confine competition to the home markets. While new cities and towns are forming, a distant manufacturing center can supply their markets without much regard to freight rates. When, however, such cities become themselves manufacturing centers of importance, then the rate charged by the carrier has an important bearing upon the question of the trade of the older town in the newer territory. Such a state of trade has been already reached west of Chicago, as we know it in the East. Looking at the question broadly, it is not well that competition should be confined to any particular territory by any system of rates; and in obedience to this principle also we find as before that rates west of Chicago were high enough to be a restraint upon freedom of trade, and should be reduced. We know of a case

where a manufacturer in the lake region was selling his goods west of the Missouri River at a loss of \$200 per car to hold his trade against the local maker. Trade laws demand a recognition of the local manufacturer or jobber, but do not ask that any local market should be controlled wholly by any one. The inevitable result of such a case would be higher prices to the retailer and consumer. The situation of the warring roads resolves itself into this—that it is an effort to adjust trade to the laws of supply and demand.

The actual profit which a maintenance of the present value of copper over 12 months would give to some of the copper companies and at the corresponding profit on the shares, the *London Mining Journal* estimates that a net profit of £45 per ton of copper—the amount of the recent rise—would show the following results:

Company.	Twelve months extra profit.	Per share
Rio Tinto	£1,047,500	£23. 5/0
Mason & Barry	319,050	1. 14/0
Tharsis	495,000	0. 15/6
Cape Company	242,550	12. 12/0

These figures are based on the out-turn of each company during 1886. It is, perhaps, too much to hope that the present inflated price of bars can be maintained for so long a time, and it may be of interest to state the case in a different way. Assuming that the price should drop to an average of £70, which is, we think, a liberal discount, considering the present position of stocks, and the improbability of supplies affecting them for some time to come, we estimate from the additional profit which the £30 advance in copper would give, that the share values, as compared with those ruling in 1886, should stand thus:

Company.	Additional profit with £30 advance in copper.	Equal to per share for the year.	Equivalent dividend on this profit per cent.
Rio Tinto	£705,000	£22. 3/4	213 1/2
Mason & Barry	212,700	1. 3/0	11 1/2
Tharsis	330,000	0. 11/3	28
Cape Company	161,700	8. 1/8	101

The English tin plate manufacturers do not take kindly to the tin syndicate. At the meeting of the Swansea Bank, Mr. M. B. Williams, the chairman, said that "he thought it would be a grave mistake for the makers to identify themselves and to make common cause with the tin syndicate. The present excessive price of tin must stimulate production and check consumption, and the effect must be that the tin 'corner' would collapse." And Sir John Jenkins, a large tin plate manufacturer, who afterward spoke, said "that makers intended having nothing to do with the block tin syndicate, for they were convinced that by doing so they would be injuring their own position. The syndicate was a strong one, and, if it thought fit, might keep up the price to an abnormal value for some time, perhaps for the year; but when the collapse came it must tell seriously on the syndicate, and the more so the longer the 'corner' was maintained."

A meeting of car-axle manufacturers was held at Indianapolis, Ind., on Wednesday and Thursday of last week, with a view to advancing the price of axles. Another meeting will shortly be held at Pittsburgh to complete the arrangements. The price of iron axles has been very low of late, some sales having been reported at 1.9 cents, although the leading manufacturers have refused to take orders below 2.1 cents at works.

CORRESPONDENCE.

Puddling Direct Metal.

To the Editor: Having given much attention to the subject and made experiments here in October last in melting pig iron in a cupola and pouring it into the puddling furnace, making heats in less than one hour, I have read with much interest of the "New Departure" at Chicago in your issue of 2d inst. From the results of our experiments, which were made in a very crude way, I feel convinced that the plan is practicable, that, even if the iron is melted in a cupola, a great saving in cost can be made and also that the output of a mill can be increased fully one-third. It is, of course, well known that there is a great waste of time, fuel, fire and fire-brick in melting pig iron in a puddling furnace, while, even under the best of circumstances, it is but a poor melter as compared with a modern cupola.

It is to be hoped that the North Chicago Rolling Mill Company may soon be able to give us the results of their experiments, and that they may be entirely satisfactory, because if some means are not soon devised for cheapening the cost of making puddle iron, the manufacture of it will, before many years, be a thing of the past.

Yours very truly,
THEO. F. PATTERSON.

SAFE HARBOR IRON WORKS,
SAFE HARBOR, PA., February 13, 1888.

To the Editor: In an article in your issue of February 2, under the heading "A New Departure in Puddling Iron," you say the North Chicago Rolling Mill Company may well feel proud, as, so far as is known, it is the first successful attempt in puddling blast furnace metal. Permit me to say that this is not so, as the Chilling-ton Iron Company, of Wolverhampton, Staffordshire, England, more than 40 years ago had 25 puddling furnaces working hot metal direct from the blast furnace, but used the product exclusively in the manufacture of rails, as all attempts to make a bar to fill other requirements of the trade failed, owing to a lack of uniformity. Five years ago Mr. Samuel Fulton, of the Plymouth Rolling Mill Company, Conshohocken, was about commencing to make iron the same way, but for reasons I am not acquainted with abandoned it. As regards steel, the first Bessemer steel made in this country was made in Troy, in February, 1865.

SAMUEL T. HODGKINS.
NORRISTOWN, PA., February 11, 1886.

A Year's Work of a Barb-Wire Mill.

The Iowa Barb-Wire Company, of Allentown, Pa., have developed rapidly in their new mill. Local newspapers print the following details of their year's business:

The mill gave employment last year to an average of 250 hands, and in the same period of time the company's pay roll was \$129,305.13. The freight bills paid at Allentown amounted to \$35,937.03. There were shipped from the works 9392 tons of all kinds of manufactured products. The freight received amounted to 20,066 tons, divided as follows: Coal and coke, 8250 tons; rods and wire, 9799 tons; lumber, 520 tons or 450,000 feet; acids, 765 tons, and 752 tons of other materials. The lumber mentioned was used up in making the reels upon which the wire is wound for shipment.

Following is a comparison of the shipments in pounds during 1886 and 1887. During the first-named year the works were located at Easton:

	1886.	1887.
January.....	703,962	286,474
February.....	1,152,462	437,078
March.....	1,512,926	845,380

April.....	919,311	1,660,339
May.....	1,432,619	2,017,910
June.....	866,613	1,959,052
Total first six months.	6,587,893	7,206,233
July.....	1,164,772	990,145
August.....	1,303,632	1,769,141
September.....	1,201,009	1,687,192
October.....	708,628	1,591,240
November.....	155,909	1,279,185
December.....	665,129	1,328,243
Total last half year.....	5,099,139	8,645,146

Total for year.....11,687,032 15,851,379

From the above table the reader will be able to tell at a glance with how much prosperity the company has met. As 1886 had been the best year in the history of the company up to that time, the increase made in 1887 gives that period the palm over all previous years. Notwithstanding that October, November and December are the dullest months of the business, it will be seen that the shipments were large compared with many previous months, and that the six months including these three dull ones show the largest shipments in the history of the company.

An exceedingly good start has been made in the business for 1888, during the month of January 1,460,736 pounds of material being shipped. To date in February the shipments are in excess of any corresponding month. On Tuesday the largest shipment on any one day was made, being 162,420 pounds of wire, or more than was shipped during the entire month of November, 1886, when the company was moving from Easton.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., February 14, 1888.

The Committee on Ways and Means came together to-day, it being their regular day for meeting. After a long struggle over iron ore and coal they have abandoned their purpose of placing those articles on the free list, and propose a compromise rate of 50 cents a ton on ore and 50 cents a ton on coal. The committee expect by this means to strengthen themselves in certain localities where they were weak. The large output in the Michigan region and the growing reduction of iron ore in Virginia, Alabama and other sections of the South have called a halt on that subject. The Sub-Committee, Mr. Scott, of Pennsylvania, and Mr. McMillan, of Tennessee, in charge of the metal schedule, have been wrestling with the items in this portion of their bill, and as a basis to work on and practically as a finality, have decided upon the following changes and reductions in the duties on metals and manufactures thereof. The first column shows the proposed duty and the second the present duty:

Iron in pigs, spiegeleisen, wrought and cast scrap iron, and scrap steel, 1/4¢ p. lb. T.....	\$4.50	\$6.72
Iron railway bars weighing more than 25 lb to the yd., T.....	\$11.00	\$17.00
Steel railway bars and made in part of steel, weighing more than 25 lb to the yd., T.....	\$11.00	\$17.00
Bar iron, flats not less than 1 in. wide nor less than 3/4 in. thick, lb.....	8-10¢	8-10¢
Round and square iron not less than 3/4 in. in diameter or square, lb.....	9-10¢	1¢
Flats, less than 1 in. wide or less than 3/4 in. thick, round iron less than 3/4 in. and not less than 7-16 in. in diameter, and square iron than 3/4 in. sq., lb.....	1¢	11-10¢
Provided that other forms less finished than iron in bars and more advanced than pig iron, except castings, shall be rated as iron in bars and pay a duty accordingly, and none of the above iron shall pay a less rate of duty than.....	35 ¢	35 ¢
Provided further, that all iron bars, blooms, billets, or sizes or shapes of any kind in the manufacture of which charcoal is used as fuel, shall be subject to a duty of T.....	\$22.00	\$22.00
Iron or steel tee rails, not over 25 lb to the yard, lb.....	9-16¢	8-10¢
And iron or steel flat rails, punched, T.....	\$15.00	8-10¢
Round iron less than 7-16 inch in diameter, and bars and shapes of rolled iron, n. s. e. or p. f., lb.....	1¢	12-10¢

Iron and steel railway fish plates and splice-bars, lb.....	1¢	1 1/4¢
Horseshoe nails, a d all other wrought-iron or steel nails, n. s. e. or p. f., lb.....	3¢	4¢
Boiler tubes, lb.....	2 1/4¢	3¢
Files, file-blanks, no change, but duty not to exceed 60 ¢ ad. val.....	45 ¢	...
Iron or steel beams, &c., lb.....	1¢	1 1/4¢
Steel wheels, tires, &c., for railway purposes, lb.....	1¢	2 1/4¢
Ingots for same, lb.....	1 1/4¢	2¢
Copper, regulus of, &c., lb.....	2¢	3 1/4¢
Copper, Compositi n metal of, lb.....	2¢	3¢
Copper ingots, &c., lb.....	3¢	4¢
Lead pigs, scrap, lb.....	1 1/4¢	2¢
Lead sheets, lb.....	2 1/4¢	3¢
Zinc pigs, lb.....	1¢	1 1/4¢
Zinc sheets, lb.....	2¢	2 1/4¢
Yellow sheathing, lb.....	3¢	3 1/2 ¢

Boiler and other plate iron, sheared or un-sheared, skelp iron, sheet iron, black tagger's iron, no change of duty.

Provided that no duty in excess of 60 ¢ ad. v. shall be paid on any of said iron. Polished sheet iron or sheet steel, duty the same.

Provided that no duty in excess of 60 ¢ ad. v. shall be paid.

Hoop, band or scroll iron remains the same, and articles not specially enumerated of the same, 1/4 instead of 2-10¢ p. lb more duty than that imposed on the iron from which they are made, or material of chief value but no duty to be paid in excess of 60 ¢ ad. v. on said articles.

Steel ingots, &c., 45 ¢, 2¢, 2 1/4¢ 45 ¢, and 3 1/4¢ lb additional when subject to additional process. Steel circular-saw plates 1¢ lb additional, but duty not to exceed 60 ¢.

Iron or steel wire, no change of duty, but no duty in excess of 60 ¢ ad. v. to be charged, and after December 31, 1886 50 ¢.*

* Evidently a misprint.

There is still discussion over pig iron, some insisting upon putting it at \$4.50 a ton and others lower, on the plea of bearing a proper relation to the duties on steel rails, which have been practically fixed at \$11 a ton, although some of the majority representation on the committee still insist upon putting the figure below \$11. There are some who believe that the bill will be ready next week, but the reticence of the committee would seem to indicate that all is not yet harmony.

Mr. Randall and friends keep their own counsel, neither saying what they propose to do nor taking any steps to meet the issue in advance of its presentation. The committee would like them to make a stir, as it would remove the element of uncertainty as to their course.

DRAWBACK ON TIN.

Senator Mitchell to-day reintroduced his bill to allow a drawback of the amount of duty, less 10 per cent., paid on cans manufactured in part of imported material filled with products of the United States and then exported where the imported material used in the manufacture of the cans equals 70 per cent. of the value of all the material used in their manufacture. A drawback equal to the full amount of the duty paid shall be allowed on cans manufactured wholly of imported material and exported filled with American products.

Long & Co., of Pittsburgh, proprietors of the Vulcan Forge and Rolling Mills, have issued a very neat price list, covering their forgings and bar iron. Interesting tables are also given, showing the weight of iron of different sizes, and the prices of iron per gross ton, calculated on rises of tenths, eighths and sixteenths. Their Western office is at 16 and 18 West Lake street, Chicago, W. E. Stockton, agent.

The introduction of fan blowers in this country during the past quarter of a century has been remarkable, and their uses have been multiplied a thousand-fold. Originally constructed almost solely for blowing forge, furnace and cupola fires, and for ventilating buildings, their uses have so multiplied that they are now used as principals or accessories in almost every line of manufacture.

The men of the Burden Iron Works, Troy, are supporting the heaters and rollers in the Albany mill of the Troy Steel and Iron Company, having voted lately to give them 5 per cent. of their earnings.

TRADE REPORT.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, February 15, 1888.

There has been no change for the better in the condition of the Pig-Iron market. On the contrary, the feeling is worse at the present time than it was a week ago, particularly on Scotch Iron. The break in prices has, instead of proving an incentive for consumers to stock up, had quite the reverse effect. As a consequence of this, supplies continue to steadily increase on furnace banks, and the accumulations are now so heavy that makers are shipping considerable iron to storehouses. The force of circumstances is beginning to have some influence in the direction of causing makers to consider the propriety of lessening their output, and already several firms are preparing to blow out furnaces. Brokers take a very despondent view of the situation, and go so far as to assert that the turn of the tide since the first of the year has virtually paralyzed trade. Warrants sold down to 38/10, but show a little improvement to-day at 39/1, buyers. Makers' Iron is irregular. Bessemer Pig is a shade lower.

The depression in the Pig Iron branch naturally tends to somewhat affect the tone of the market for Steel productions. However, makers are well engaged on old contracts in most quarters and as yet there is no perceptible weakening of prices.

There continues to be more addition to the Steel-making plant in various localities, the outcome of which is problematical. The Dowlais Iron and Steel Company will build two basic Steel furnaces; the Messrs. Cammells, Sheffield, propose erecting a Steel works on the Cumberland Coast, and the Stockton Malleable Iron Works are laying down a Steel-making plant.

The British Iron Company's Ruabon works have been closed, owing to present unfavorable conditions and uninviting outlook.

The exports of Steel Rails continue to exceed those of a year ago. The January total was 79,000 tons, against 51,000 for the corresponding month in 1887. It is, however, not as large by 19,000 tons as that for December last.

The Tin-Plate makers are still endeavoring to effect some sort of agreement by which the industry may be placed in a more satisfactory condition. In the present state of affairs the output is largely excessive, and prices are a good margin short of being satisfactory. The proposition to reduce the output gains favor, and evidences are not wanting that measures will soon be agreed upon whereby a curtailment of unmistakable character will be effected. The Board of Trade returns show total exports last month of only 20,000 tons, against 29,000 tons in December and 26,000 tons during January last year. The stocks at shipping points have increased materially. It is estimated that there are now at the various points a total of no less than 215,000 boxes, an increase of about 20,000 boxes since January 1 and 60,000 boxes since November last. Prices

for all descriptions of Plates stand practically the same as quoted last week, but lack firmness.

It is stated, on very good authority, that the syndicate has positively completed arrangements with all the principal Copper mining companies whereby the realization of the endeavors of the syndicate is assured. There is a tacit understanding that the mining companies shall not press their producing resources, but, to the contrary, reduce the future output somewhat below the present volume. The two interests are thus to work harmoniously in the direction of establishing the higher level of prices reached the past 60 days. No sales are yet reported of American Furnace Material. Smelters are well stocked and not inclined to take hold at the prices asked.

Scotch Pig.—Business slow and prices weak, but showing no radical change.

No. 1 Coitness, f.o.b. Glasgow,	49/
No. 1 Summerlee,	49/6
No. 1 Gartsherrie,	46/6
No. 1 Langloan,	47/
No. 1 Carnbroe,	42/
No. 1 Shotts,	47/
No. 1 Glenzarnock,	45/
No. 1 Dalmeilington,	42/
No. 1 Ghlinton,	41/6

Steamer freights, Glasgow to New York, 5/; Liverpool to New York, 7/6.

Cleveland Pig.—There has been no material change; buyers very cautious. No. 1 Middlesboro', G. M. B., 34/; No. 3 do., 31/6.

Bessemer Pig.—A fair business passing, but prices still unsettled. West Coast brands, mixed numbers, 43/6, f.o.b.

Spiegeleisen.—Trade moderate, but prices steady. English 20 % quoted at 75/ f.o.b.

Steel Rails.—The demand fairly active and prices steady. Standard sections, £4 @ £4. 2/6, f.o.b.

Steel Blooms.—Very little doing and prices nominal. We quote at 72/6 @ 75/ f.o.b., for 7 x 7.

Steel Billets and Slabs.—Sellers firm, but the demand slower. Bessemer 2½ x 2½ inch Billets, £4. 5/, and Nail Slabs, £4. 2/6, f.o.b.

Steel Wire Rods.—A moderate business doing at previous prices. Mild Steel, No. 6, quoted at £5. 17/6 @ £6, f.o.b.

Old Rails.—Transactions light, and prices quite nominal. Tees quoted at £2. 17/6, and Double Heads £3, c.i.f., New York.

Scrap Iron.—Demand continues moderate. Heavy Wrought at 47/6 @ 50/ f.o.b.

Crop Ends.—Fair sales making at steady prices. Bessemer quoted £2. 5/ @ £2. 7/6, f.o.b.

Tin Plate.—No quotable change in prices. Business only fair. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	16/6 @ 17/
IC Bessemer steel, Coke finish	14/9 @ 15/6
IC Siemens	15/ @ 15/3
IC Coke, B. V. grade	14/9 @ 15/
Charcoal, Terne, Dean grade	13/6 @ 13/9

Manufactured Iron.—The market retains a firm tone, but demand has slackened somewhat. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	7 10 0 @ 7 10 0
" Common	5 2 6 @ 5 5 0
" B's Sheet, singles	6 15 0 @ 6 17 6
Welsh Bars (at Wales)	4 15 0 @ 4 15 0

Tin.—Buyers few and cautious, market looking weaker. Straits closed at £166. 10/ spot, and £143 @ £143. 10/, three months' futures.

Copper.—Transactions moderate, but the market very firm. Chili Bars closed at £77. 15/ @ £78. Best Selected, £80 @ £80. 10/.

Lead.—The market quiet and barely steady. Soft Spanish £14. 15/ at the close.

Spelter.—Demand somewhat improved and the market firmer. Silesian, ordinary, £19. 10/ @ £19. 15/ at the close.

Financial.

OFFICE OF THE IRON AGE,
WEDNESDAY EVENING, February 15, 1888.

The features of the week under review are a continued cutting of rates on Western roads, a check in speculation in securities, stagnation in the produce markets and an easy tendency in the prices of grain. Added to these influences were reports concerning the coal miners' strike, generally of a more hopeful character. The end is now commonly believed to be near at hand. Despite the drawbacks mentioned there is a manifest improvement since the lifting of the snow embargo, which is most noticeable in the dry goods jobbing trade, a large number of buyers being present. Interior and Western markets, too, give very good reports respecting the distribution of staple cotton and woollen specialties. At the same time, there is complaint of the very small margin of profits returned to manufacturers. The Senate Finance Committee agreed to adopt the amendment to the Undervaluations bill, allowing an appeal to circuit courts in questions of classification where importers are dissatisfied with the decisions of the Board of General Appraisers. In this city, a strong hostility to the measure is manifested, the president of the Importers' Association openly charging that the bill is the work of domestic manufacturers who desire to drive foreign merchandise out of this market. At a meeting of the trade on Tuesday, the report of the Committee on Organization adopted the name, "Woolen Goods Association," with its object "to promote more thorough intercourse between producers and sellers of goods, tending toward a better management of the market." It will have handsome quarters and be of the nature of a Board of Trade or Exchange.

The Stock Exchange markets are unprecedentedly dull and featureless. The action of Congress upon the bill authorizing the investment of the Treasury surplus in United States bonds is awaited with interest.

United States bonds closed as follows:

U. S. 4½s, 1891, coupon	107½ @ 108
U. S. 4s, 1907, coupon	125½ @ 125¾
U. S. Currency 6s, 1895	120 @ 120½
U. S. Currency 6s, 1894	122 @ 122½
U. S. Currency 6s, 1877	124 @ 124½
U. S. Currency 6s, 1892	26 @ 26½
U. S. Currency 4s, 1890	128 @ 128½

On the Produce Exchange the markets are dull, easy and neglected, with prices a little lower in the absence of business. The feature of the local market is an increased export demand for wheat not only, but corn, stimulated by lower prices. Prices for refined lard were advanced. Breadstuffs are firmer, in sympathy with Chicago, where a reduction of one-half has been made in the storage rates on grain. Cotton is dull and unsatisfactory. The sugar trade was excited by reports that the sugar Trust would relieve this market of any surplus by shipping large quantities of the best refined to England, also that large purchases had been made in Louisiana for their refineries in New Orleans. It is now understood that another cargo has sold, cost and freight, at 3½¢ for 96 centrifugal.

The gross exchanges of 36 cities for the week show a decrease of 2.2 %, as com-

pared with the corresponding week last year. Outside of New York the increase is 1½ %. Boston reported a gain of 6.7 %; Chicago, 15.6; Philadelphia, 17.9, and San Francisco, 47.3 %. The loss at New York was 9 %, and at Wichita 46.9 %. The foreign exchange market was firmer, and posted rates were advanced to \$4.85 and \$4.87. The feature of the last two statements issued from the New York Clearing-House has been the large expansion of loans—some \$9,500,000. In the absence of speculation this demand for money speaks well for the condition of general trade. Despite the loss in reserves, the banks still have a surplus of over \$20,000,000, and money is easy to obtain at low rates of interest. Call loans have settled down to a 2 @ 3 % basis, and time accommodations are quoted only slightly above these figures. According to the Custom-House report the exports of specie for the week amounted to \$511,720, of which \$238,300 was Spanish gold for Havana; and the imports were \$19,000. The Reading Company have entered into control of the Schuylkill Navigation Company by electing Reorganization Trustee West as president and placing four other trustees in the Board of Directors.

The imports of merchandise at this port for the week were valued at \$9,545,000, of which \$3,639,000 represents dry goods. Since January 1 the imports are \$55,825,000, as compared with \$51,420,000 for the same time last year and \$48,378,000 in 1886. The exports were \$6,109,488, showing much improvement. Since January 1 the total is \$35,815,694, as compared with \$32,378,932 for the corresponding period last year and \$39,939,655 in 1886. The items include 295,500 bushels of wheat, 125,800 packages wheat flour, 5,924,000 gallons of petroleum, 4437 lb lard, 21,552 bales of cotton.

The heavy imports at the port of New York for January, amounting to \$38,204,083, do not indicate a favorable condition of our foreign trade when compared with the exports for the month, valued at only \$25,795,830. The imports were nearly \$4,000,000 above those of January, 1886, and only in three previous years were the imports for the first month equal to those now reported. In cotton and mineral oils there was a heavy decrease.

Judge McCue was confirmed as Assistant-Treasurer at New York. The Comptroller appointed James McConville to be receiver of the Metropolitan National Bank, of Cincinnati, and an assessment of 20 % on the stock of the Queen City Bank was ordered to make good losses and deficiency.

Business failures for the week numbered 289 for the United States and Canada, as compared with 267 failures for the corresponding week last year. The increase is principally in Canada.

Francis Weiss, president of the Alden Coal Company and of the Lehigh Valley National Bank, died on Tuesday, in Bethlehem, Pa., aged 69 years. He was largely interested in the Bethlehem Iron Company and other industries.

The California fruit market was more active during 1887 than before in the history of the State, and the producers were satisfied with the prices realized. The following gives complete shipments East for the past two years:

	Pounds. 1886.	Pounds 1887.	Value.
Ripe fruit	15,353,900	36,801,632	2,890,000
Dried Fruit	3,887,720	14,764,910	1,711,000
Canned goods	15,970,590	42,616,820	3,829,000
Raisins	9,551,390	12,237,670	1,170,000
Total	44,763,570	96,391,032	9,531,000

The increase for the year 1887, it will be observed, is more than doubled, compared with the previous year.

NEW YORK.

The official statement of the Bureau of Statistics shows the imports of Iron and Steel into the United States to have been as follows:

	1887.	1886.
Iron Ore, gross tons.	1,194,301	1,039,433
Pig Iron, gross tons.	467,522	361,768
Scrap Iron, gross tons.	313,418	87,170
Scrap Steel, gross tons.	26,532	10,139
Steel Rails, gross tons.	137,588	41,581
Bar Iron, net tons.	40,565	32,647
Cotton Tie, net tons.	24,276	12,560
Steel Hoops, Sheets and Plates, net tons.	26,885	4,719
Steel Ingots, Blooms, Billets and Slabs, net tons.	347,818	167,257
Sheet, Plate and Taggers Iron, net tons.	8,012	6,852
Tin Plates net tons.	317,896	288,761
Wire Rods, net tons.	167,272	153,401
Wire and Wire Rope, net tons.	3,247	2,689

American Pig.—Furnace agents and dealers unite in pronouncing the trade extremely dull, with little doing beyond the sale of small lots to meet urgent requirements. In some quarters, however, a slight increase of this character is reported. The reports of putting into store of quite a large lot of Southern Iron turns out to have been due to difficulty of delivery through obstruction in navigation, and to crowding of a leading consumer's yard. A part of the Iron thus stored has already been withdrawn. We print elsewhere a series of letters from consumers of Iron, indicating the effect upon their business of the coal strike. It will be observed that the work of some is not influenced by it at all, while others report that serious damage is done them. We continue to quote \$21 @ \$22 for small lots of No. 1 Foundry, the only quotations available, \$19 @ \$20 for No. 2 and \$16.50 @ \$17 for Gray Forge.

Scotch Pig.—The market has been disturbed by the low offerings of one seller of Scotch Pig, Langloan being reported to have sold at \$19.50. We quote nominally for small lots: Coltness, \$21 @ \$21.25; Dalmellington, \$19.75 @ \$20; Summerlee, \$21 @ \$21.25; Eglinton, \$19.25 @ \$19.50; Glengarnock, \$20.25 @ 20.50 and Clyde \$19.75 @ 20.

Bar Iron.—We quote in carload lots on dock, 1.75¢ @ 1.80¢ for Common; 1.80¢ @ 1.90¢ for Medium, and 1.90¢ @ 1.95¢ for Refined, with half extras.

Structural Iron.—We quote Bridge Plates at 2.10¢ @ 2.20¢; Angles, 2.25¢ @ 2.40¢, and Tees 2.75¢ @ 2.90¢ in round lots on dock, and Beams and Channels at 3.3¢. A Beam mill lately started is offering the latter at concessions.

Plates.—We quote Steel Plates 2.5¢ @ 2.7¢ for Tanks, 2.75¢ @ 2.95¢ for Shell and 3.15¢ @ 3.25 for Flange.

Steel Rails.—Although considerable negotiations are pending no sales of any consequence have been reported during the current week, the market remaining steady at \$31.50 @ \$32, at Eastern mill, for standard sections. The official report of the Board of Control placed the sales up to February 1st at 395,000 tons. This does not include large transactions made during the last two weeks. A daily newspaper in this city prints the following estimate of the orders taken: Bethlehem, 63,000 tons; Edgar Thomson, 70,000 tons; Cambria, 35,000 tons; Pennsylvania, 62,000 tons; Cleveland, 13,000 tons; Carnegie, 70,000 tons; North Chicago, 45,000 tons; Troy, 20,000 tons; Scranton Steel, 25,000 tons; Lackawanna, 70,000 tons; Joliet, 40,000 tons; Union, 10,000 tons; Worcester, 6,000 tons, and Western, 22,000 tons, a total of 561,000 tons. These figures are wrong to the extent of the duplication of "Edgar Thomson" and "Carnegie," an error of 70,000 tons, and the omission of the Springfield works. They are a little too high for some mills and considerably too low in the case of at least one manufacturer. The aggregate is prob-

ably close to 500,000 tons. It is of interest to compare the orders as given with the allotment, which is: Bethlehem, 72,000; Edgar Thomson, 106,032; Cambria, 64,000; Pennsylvania, 78,400; Cleveland, 38,400; North Chicago, 100,000; Troy, 36,000; Scranton, 64,000; Lackawanna, 64,000; Joliet, 64,000; Union, 64,000; Worcester, 11,200; Springfield, 36,000 and Western, 50,000. It will be observed that while the allotment of the mills west of the Allegheny Mountains, including Cambria, is 522,432 tons, the orders are only 235,000 tons, while the Eastern works with an allotment of 325,600 tons are credited with 246,000 tons. Rumors of a sale close up to 30,000 tons by a mill in Western Pennsylvania are denied.

Old Rails.—We note the sale of a lot of 2000 tons of Tees by the New York Central to a Pittsburgh mill at private terms, and purchases of a number of small lots by an Eastern manufacturer of Track Material. We continue to quote \$22 @ \$22.25 for Tees and \$23 @ \$23.25 for Double Heads.

Track Materials.—We learn of sales of 10,000 kegs of Spikes for the West and of 100,000 sets of Angle Bars at our quotations. Last week a meeting of the Spike Association was held in this city, at which the allotment system was continued, no attempt being made to fix prices. The two leading mills in the association have 31 and 30 % respectively, followed by a Western mill with 9 % and an Eastern works with 8 %. The two leading mills are reported to have a capacity of 1300 and 1200 kegs of Spikes daily, running double turn. The tendency appears to be to put the control of the business more and more into the hands of those running automatic machines, making Spikes without reheating. We continue to quote Spikes \$2.10 @ \$2.20 delivered, Angle Bars \$1.85, and Bolts and Nuts 3¢ @ 3.10¢.

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, PA., February 14, 1888.

Pig Iron.—The conditions which have prevailed since the first of the year seem to be in force yet. Dullness and uncertainty are the most prominent features. The offerings are extremely small, yet there appears to be enough to go around and a little to spare, which is almost equivalent to lower prices. In any case it would be impossible to sell large lots at market rates, and probably still more difficult to buy large lots without advancing prices. Meanwhile things are in a rut, and how long they will remain there and in what direction the next turn will be seems beyond human foresight to predict. A great many people are inclined to think that reserve stocks are being drawn upon to an extent that will bring a sharp reaction before long, and such a contingency is by no means improbable. But past experience has shown that it takes a wonderfully long time to arrive at the point of exhaustion, and, besides that, it must be remembered that the output is still on a scale that two or three years ago would have been considered enormous. Still, there is a very large business in sight, and it only needs just a slight movement to set the entire machinery of trade in motion. Shipyards, bridge builders, locomotive builders, and machine shops are all crowded with work, quite as much so as at this time a year ago. There is a loss in the demand for Steel Rails and for Pipe Iron, and in some branches of the foundry trade, but with these exceptions consumers seem to have all the work they can handle. The loss in the Pig Iron trade is largely in furnaces that were running on Bessemer, but, apart from that, the rolling mill trade seems to have shrunk to small proportions, which

is somewhat anomalous, considering that consumers are so full of work. In fact, the entire position is so beset with contradictions that the trade know not what to expect, which probably is one of the chief reasons for the prevailing hesitancy. Prices are very irregular, for standard brands firm, but there is an increasing supply of new brands at inside rates, which has a tendency to check any movement toward higher figures. Taking the market as a whole, therefore, it cannot be said to have gained in strength during the past week, but supply and demand are fairly balanced at from \$20.50 to \$21.50 at tide for No. 1 Foundry, \$19 for No. 2 and \$17 @ \$17.50 for Gray Forge. In special cases higher or lower prices may have been made the basis of transactions, but all depends on brand, delivery and other conditions. The preponderance is rather in the supply of new brands, which can only be placed by making concessions of more or less importance to those who are disposed to give them a trial.

Foreign Iron.—Nothing doing in either Bessemer or Spiegel, which are nominally as quoted a week ago, viz.: Bessemer, at about \$20, c.i.f., duty paid; 20 % Spiegel, at \$27.50 @ \$28. There is some inquiry for Middlesboro' Iron, but there is not much probability of business being done; buyers talk \$16 @ \$16.50 for No. 3, with sellers at about \$1 more.

Blooms.—The market is extremely dull, and only small lots are taken at prices about as follows: Foreign, \$30 @ \$31 for Nail Slabs; \$31.50 @ \$32.50 for 4 x 4 Billets, and \$35 @ \$39 for Siemens-Martin, price according to analysis, &c. Domestic Blooms: Steel, from \$30 to \$35, f.o.b. cars at mill, according to analysis; Charcoal Blooms, \$53 @ \$54; Run-out Anthracite, \$45 @ \$46; Scrap Blooms, \$38 @ \$39 @ "bloom" ton.

Muck Bars.—The market is irregular; some talk it firm, while others claim that there is very little business to be had on any terms. Some mills with a reputation for quality, and favorably situated for deliveries, quote \$30 @ \$30.50, at mill, while others find it difficult to effect sales at \$29.50. About \$30, at mill, seems to be a fair average quotation for good Bars.

Bar Iron.—There is very little change to note in this department; the demand is fair, and prices moderately firm, but there is no life or animation in the market. Mills just about hold their own, but there is no gain either in price or demand, so that there is as much uncertainty as ever in regard to the future. An increase in the volume of business is usually looked for at this season, and judging from the large amount of work in hand among leading consumers there ought to be a very heavy demand from this time forward. At present, however, the feeling is rather despondent, and mills find it a difficult matter to run full at anything over 1.9¢, although some still ask 1.95¢ @ 2¢ for Best Refined Bars. The demand for Skelp has not materialized yet to any extent, and one or two large mills that made Skelp a specialty have shut down for want of orders. A few small lots were taken at 1.9¢, but the demand is very limited.

Plate and Tank Iron.—The demand has not increased to any extent, and mills are mostly running on orders received from day to day. Some of the leading concerns that have an established trade manage to run full at about quoted rates; but others have to take such orders as they can get, and usually at some concessions in price. On the whole the market may be called dull and irregular at about the following quotations asked: Ordinary Plate, 2.15¢ @ 2.20¢; Tank, 2.20¢ @ 2.25¢; Shell, 2.5¢ @ 2.6¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.4¢ @ 2.5¢;

Shell, 2.8¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3¼¢ @ 4¼¢.

Structural Iron.—The demand for shapes keeps up very satisfactorily and mills are nearly all running up to their full capacity. New orders are neither large nor numerous, but there is a large amount of work under contract, and, with a great deal more in prospect, continued activity seems to be assured for a long time to come. Prices are steady at about the following quotations: 2.15¢ @ 2.25¢ for Bridge Plate; 2.25¢ @ 2.35¢ for Angles; 2.8¢ @ 2.9¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel.

Sheet Iron.—There is a good demand for Light Sheets, but for the lower numbers there is very little doing at present. Mills are running full, and as stocks were pretty well exhausted at the close of the year a temporary dullness will hardly be noticed for awhile. Small lots of the best makes are quoted about as follows:

Best Refined, Nos. 26, 27 and 28.....	3¼¢
Best Refined, Nos. 18 to 25.....	3¼¢
Common, ¼¢ less than the above.....	3¼¢
Best Bloom Sheets, Nos. 26 to 28.....	4¼¢ @ 4½¢
Best Bloom Sheets, Nos. 22 to 25.....	4¼¢ @ 4½¢
Best Bloom Sheets, Nos. 16 to 21.....	3½¢ @ 3¾¢
Blue Annealed.....	2.8¢ @ 3¢
Best Bloom, Galvanized, discount.....	60 ¢
Common, discount.....	65 ¢

Steel Rails.—A fair amount of orders has been entered within the past couple of weeks, and there is a disposition to regard the lowest point of depression as having been passed. The feeling is one of increased confidence, and while a few desirable orders have been entered at slightly under \$32 at mill, it needs to be something very tempting to secure acceptance on same terms now, as the demand is likely to improve considerably within the next 60 days. Meanwhile about \$32 @ \$32.50 is asked for the ordinary run of orders with prices moderately firm at those figures.

Railway Supplies.—There is not much demand at present, and prices are barely steady at 2.15¢ @ 2.25¢ for Spikes, 1.9¢ @ 2¢ for Fish Plates and 3¢ @ 3.10¢ for Track Bolts.

Old Rails.—The market is still in a somewhat languid condition, although buyers could be found for good sized lots at about \$21.75 @ \$22 for T's. Holders ask \$22.50, but do not offer large lots, so that there is an undercurrent of strength, notwithstanding the inactivity. A sale of about 600 tons was made at \$22.25 to arrive, which to-day would probably be a fair average quotation for actual business.

Scrap Iron.—Good scrap is scarce and firm. Mixed lots in yard or afloat could probably be had at \$20 @ \$20.50, but good qualities are saleable at about the following rates: No. 1 Scrap, \$21 @ \$21.50; carload lots, \$22 @ \$22.50, or for choice lots \$22.50 @ \$23; No. 2 do., \$14 @ \$15; Turnings, \$15 @ 16; Old Car-Wheels, \$17.50 @ \$18; Old Steel Rails, \$20 @ 21; Cast Scrap, \$16 @ 17; do. Borings, \$11 @ \$12; Old Fish Plates, \$26 @ \$27; Old Car-Wheels, from \$18 to \$19, delivered.

Wrought-Iron Pipe.—Very little business doing, and prices weak and unsatisfactory. Manufacturers anticipate a firmer market about the middle of March, at which time the demand usually increases. Discounts remain as last quoted: Black Butt-Welded, 50 ¢; on Galvanized do., 42½ ¢; on Black Lap-Welded, 62½ ¢; on Galvanized do., 50 ¢; Boiler Tubes, 57½ ¢.

Nails.—A meeting of the Eastern Association was held Thursday, 9th inst., in this city, and several changes in schedule of extras were adopted, which appear in another part of the paper, to go into effect at once. The prospect for a large spring trade creates some degree of confidence. Prices at the moment are quoted at \$2.10

Chicago.

Office of The Iron Age, 95 and 97 Washington St., CHICAGO, February 13, 1888.

The local Iron market has been comparatively featureless during the past week. Trade in all lines is moving about the same as it has been. A few business houses are finding their orders increasing in consequence of the low freight rates to points in the West and Northwest, but they are the exception and not the rule.

Pig Iron.—The usual February trade is in progress. During this month sellers expect but a light demand, and they are not being disappointed this year. Carload orders are reasonably abundant, but large sales are very rare. The heaviest transaction reported during the week was a sale of 1000 tons of Lake Superior Charcoal Pig. The price of this commodity continues firm, in marked contrast with the course of Coke Pig. Should the weakness in the latter continue for any length of time the price of Charcoal Pig would probably sympathize, notwithstanding the scarcity of that class of Iron and the prospect of the year's demand absorbing the full supply. In some quarters the belief is entertained that Coke Iron prices have touched bottom, but this sentiment is by no means general. Ohio Coke Irons continue to be a disturbing element, and there is no reason to expect Southern Iron-makers to depart from their custom of offering their product at cut prices whenever they are threatened with an accumulation. At the moment there is more pressure to sell on the part of Ohio manufacturers than Southern makers. The condition of the trade is unsettled more or less by the fact that Ore contracts have not yet been made. The price of Coke is the subject of much correspondence, and efforts are being made to hammer freight rates on materials and on finished product. Owners of furnaces situated to make either Bessemer or Foundry Pig are hesitating about making contracts for raw materials until it is definitely decided which product shall claim their attention this year, and the general market for Pig Iron will of course be affected by their decision, unless in the meantime the demand should so increase as to take the entire supply from every source. The volume of business is now of such a character that quotations are difficult to make, and it is possible that good orders could be placed at considerable concessions, except on standard brands of Lake Superior Charcoal. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, all numbers, \$21.50 @ \$22; Alabama Car-Wheel, \$26; Southern Charcoal Foundry, \$20.50 @ \$21.50; Jackson County Softeners, No. 1, \$20.50 @ \$21; Hocking Valley, Soft Foundry, No. 1, \$20 @ \$20.50; Hocking Valley, guaranteed Silicon, No. 1, \$21; American Scotch, No. 1, \$20.50 @ \$21.50; Lake Superior Coke, all Ore, No. 1, \$20 @ \$21; No. 2, \$19 @ \$20; No. 3, \$17.50; Cinder Mixed, 50¢ less; Coke Bessemer, run of furnace, \$20; Southern Coke, No. 2, \$19 @ \$19.50; No. 2½, \$18.50 @ \$19; No. 3, \$18.50; No. 1 Mill, \$18; No. 2 Mill, \$17.50.

Bar Iron.—A light demand is reported, although at least one order was placed for a considerable quantity of Car Iron. Prices are again weak, owing to low quotations made by mills anxious to secure business. Mill orders for Common can be placed at 1.70¢ @ 1.75¢, half extras, f.o.b. Chicago, and for good Muck Bar Iron at 1.85¢ @ 2¢, according to quality and specifications. Store prices continue at 2¢ @ 2.2¢, according to quality, with concessions to best buyers.

Structural Iron.—The demand is improving with the approach of the building season. Mill orders, f.o.b. Chicago, continue to be quoted as follows: Angles, 2.35¢ @ 2.40¢; Tees, 2.75¢; Universal

Plates, 2.50¢; Beams and Channels, 3.4¢. Store prices are $\frac{1}{10}$ ¢ @ $\frac{1}{2}$ ¢ higher than these rates.

Plates.—Some good orders have been taken at prices not made public, but which are known to have been very low. Tank Iron is said to be as cheap now as at any time in the depressed year of 1884. Store prices continue as follows: Heavy Sheets, Nos. 10 to 14, 2.80¢; Tank Iron, 2.75¢; Tank Steel, 3¢; Shell Iron, 3¢; Shell Steel, 3.50¢; Flange, 4¢; Fire-Box, 4.75¢. Boiler Tubes are still weak, and quoted at 55 ¢ @ 57½ ¢ off, according to quantity.

Sheet Iron.—Some mill orders have been taken for Common Black, but trade is not active. No. 27 is quoted at 2.9¢ at mill, but concessions are being made on this price. Jobbers quote 3.50¢ for No. 27, with concessions for quantity.

Galvanized Iron.—A very good demand out of store is reported, with an occasional order for a carload. Small lots are still quoted at 60 ¢ off for Juniata and 60 and 5 ¢ off for Charcoal.

Merchant Steel.—The demand shows a slight increase, with a prospect of some good sales of Tool Steel about to be made. Quotations are as follows: Bessemer Bars, 2.5¢; Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.25¢; Open-Hearth Spring, 2.9¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 11¢.

Steel Rails.—Numerous inquiries are reported, but they are slow to crystallize into orders. The sales made by the local manufacturers since our last report are estimated at 15,000 tons. The demand for Light Rails, referred to some time since, is keeping up, and promises to be quite a feature of the Rail trade. Standard sections are quoted at \$34.50 @ \$35.

Old Rails and Wheels.—Small lots of Old Iron Rails have been sold at \$21.50, but the supply is not abundant. Old Car-Wheels are in as great demand as ever, and more transactions have been reported in the past few days than for many weeks. The usual price was \$21, but \$21.50 is now asked by holders.

Scrap.—Quite a movement in Old Material has taken place during the week. Sales of almost every grade are reported, from No. 1 Forge to Steel, which has so long been quiet. A still more active demand is expected. Dealers offer \$14 @ \$15 for Mixed Country Scrap. Selling quotations for carefully selected are as follows, per ton of 2000 lb: Railroad Shop or No. 1 Forge, \$21 @ \$22; Track, \$20 @ \$20.50; No. 1 Mill Iron \$16 @ \$17; Light Wrought, \$9.50 @ \$10.50; Machinery Cast, \$16 @ \$16.50; Stove Plate, \$12.50 @ \$13; Cast Borings, \$10; Wrought Turnings, \$13 @ \$13.50; Axle Turnings, \$14.75 @ \$15; Coil Steel, \$16 @ \$16.25; Leaf Steel, \$17.50 @ \$18; Locomotive Tires, \$18; Horseshoes, \$20; Axles, \$26 @ \$26.50.

Nails.—Manufacturers' agents generally report a quiet week, which they attribute to sales at cut prices by a factory anxious to unload its stock and thereby securing most of the current trade. Standard Steel Cut Nails continue to be quoted at \$2.05, f.o.b. Chicago, from factory. Jobbers report an excellent demand from the small dealers, with an improving trade in carloads. They quote Steel Cut Nails at \$2.20 and Wire Nails at \$2.90, with 10¢ off for carloads.

Barb Wire.—Jobbers are now doing a lively trade which is stimulated to some extent by the low freight rates to Western points. They realize, however, that this is simply an anticipation of the regular demand for the season and not an actual increase in the year's business. They quote 3.15¢ @ 3.25¢ for small lots of Painted and 3.10¢ for carloads, with the usual ½¢ advance for Galvanized.

General Hardware.—Manufacturers' agents are doing a good business in seasonable specialties, while some are enjoying a "second crop" of spring orders from customers anxious to take the benefit of low freights. Jobbers report carload orders for staple goods stimulated for the same reason. They are doing a very large business now, some houses finding their facilities taxed to the utmost to keep up with their daily orders. There is no special change in prices, although cutting is indulged in to some extent.

Pig Lead.—Business is quiet. Nominal quotations for carload lots are 4.70¢ @ 4.85¢, with rumors of Common Missouri offering at 4.60¢.

Jones & Laughlins, Limited, have issued from their Chicago office, corner of Lake and Canal streets, a new price list corrected to February 1. It is a pamphlet of 48 pages, and covers an immense variety of Iron and Steel products, well classified and arranged. The shape of the pamphlet makes it convenient for carrying in the pocket for ready reference.

Pittsburgh.

Office of The Iron Age, 77 Fourth avenue, Pittsburgh, Pa., February 14, 1888.

Labor complications continue to multiply and the outlook for general business is not so good in consequence. Manufacturers generally are asking for a reduction in the cost of labor, owing to the depreciation in the value of their products, and workers generally, both skilled and unskilled, are refusing to accede to the demand, and many of them, rather than submit, are disposed to strike. What the outcome will be it is difficult at present to foretell. With these labor complications adjusted and everything settled upon a lower basis, there is reason to believe that there would be a general improvement in business, as in almost every other respect the outlook is favorable. The fact that there is a Presidential election this year is not likely, in the opinion of shrewd observers, to have much effect upon trade.

River navigation has again been resumed, and large shipments of Iron, Steel, Glass and other Pittsburgh manufactures have been made to the West and South by river, as the rates are considerably less than by rail. Large shipments are being made in the Cincinnati markets, which are reshipped at Cincinnati on other boats for Louisville, Nashville, Evansville, Memphis, New Orleans and many other points West and South. In addition to cheaper rates, goods reach their destination by river about as early as by rail.

Pig Iron.—Furnacemen continue to report the market in an exceedingly unsatisfactory condition; in addition to an exceedingly light demand there is no margin for profit at the prices. Furnace owners have made a demand for cheaper labor, Coke, Ore, &c., and unless they get it or the price of Pig Iron advances considerably it looks as if they would have to blow out, as it is not to be expected that they will continue to operate their furnaces at a loss. Consumers are still able to obtain all they want within the range of our quotations. The offerings from the Mahoning and Shenango valleys also continue light, while furnaces east of here are selling more or less at Philadelphia and other points where prices are better than here. We quote prices much the same as those of a week ago:

Neutral Gray Forge.....	\$16.50 @	\$17.00, 4 mos.
White and Mottled.....	15.50 @	16.00 "
All Ore Mill.....	17.50 @	18.00 "
Silver Iron.....	18.50 @	19.00 "
No. 1 Foundry.....	18.50 @	19.00 "
No. 2 Foundry.....	18.00 @	18.25 "
No. 1 All-Ore Foundry.....	19.25 @	19.50 "
Charcoal Foundry.....	23.00 @	25.00 "
Cold Blast Chare al.....	27.00 @	30.00 "
Bessemer Iron.....	18.25 @	18.50 "

Muck Bar.—Continues dull, and prices are weak and lower. We now quote at \$27.75 @ \$28, cash, with sales reported at the prices quoted.

Manufactured Iron.—Is generally reported slow, and but few of the mills are working up to their full capacity. Manufacturers generally talk rather discouragingly, but trade will no doubt pick up within the next week or two. January and February are usually dull months for new business, although there is not the business now there was at this time last year. We quote Bars at 1.80¢ @ 1.90¢; Plates, 2.35¢ @ 2.40¢, and No. 24 Sheet, 2.85¢ @ 2.90¢, all 60 days, 2 ¢ off for cash. These prices are for first quality Iron; poorer qualities can probably be had for a tenth or two less.

Nails.—The Nail trade continues very slow, but it is expected that there will be an improvement within the next week or two, as the spring trade usually opens up about the 1st of March, as stocks in the hands of jobbers are light and prices low. Two factories here, Zug & Co. and Moorhead Bros., have been virtually out of the business for several years; Chess, Cook & Co., Schoenberger & Co., and Jones & Laughlins continue to make some, but they are making very little effort, claiming, as they do, that there is nothing in the business at present prices. We continue to quote at \$2, 60 days, 2 ¢ off for cash, with usual rebate of 10¢ per keg on carload lots and upward.

Wrought-Iron Pipe.—The demand continues light, and there is not likely to be much improvement until next month, perhaps not until the latter part of March. It is intimated that other firms will follow the example of the National Tube Works and demand a reduction of 10 ¢ on labor. This may or may not be the case. If business continues in its present unsettled and unsatisfactory condition there will probably be an attempt made in the direction indicated, but if there should be an improvement it may be abandoned. Prices continue unsettled and unsatisfactory, each firm being free to make its own rates. We quote discounts on Black Butt-Welded Pipe at 50 ¢; on Galvanized do., 42½ ¢; on Black Lap-Welded, 62½ ¢; on Galvanized do., 50 ¢; Boiler Tubes, 57½ ¢; Casing, all sizes, 55 ¢; 2-inch Tubing, 13¢ per foot net; 2-inch Line Pipe, 12¢.

Old Rails.—We are advised of a sale of 500 tons American Tees at \$24, cash, and more are offered at same price. This is a lower price than foreign Tees can be laid down here at, and while this is the case, there will be but few sales of the latter. Besides, the demand is light, as consumers are buying only as their immediate wants necessitate. While the supply of American is light, it appears to be fully equal to present wants, and this accounts for the fact that but few actual sales of foreign have been made in this market of late.

Billets, Blooms, &c.—Bessemer Billets and Blooms are quotable at \$29 @ \$30 as to size, quality, delivery, &c., with a fair demand. Nail Slabs \$29 @ \$29.50; sale 1500 tons domestic Rail Ends at \$18.70 at the works of sellers; Bloom Ends 25¢ @ 50¢ per ton below Rail Crops.

Steel Rails.—Heavy sections are still quoted at \$31.50 @ \$33, cash, at mill. The Edgar Thomson Works are still standing idle, the men refusing to submit to the reduction in the wage scale, while the owners of the works aver that they are in no hurry about starting up.

Railway Track Supplies.—There is no improvement in the demand, but it is expected that there soon will be, as is usually the case about the latter part of this month; no change in prices. Spikes,

2.60¢, 30 days, delivered; Splice-Bars, 1.90¢ @ 2¢; Track Bolts, 3¢ with square and 3.10¢ with hexagon nuts.

Old Material.—The demand continues light and prices are weak. No. 1 (Railroad) Wrought, \$20, no ton; No. 2, \$17 @ \$18; Wrought Turnings, \$13 @ \$14; Car Axles, \$26 @ \$27; Cast Scrap, \$16.50 @ \$17, gross; Cast Borings, \$12 @ \$13. There is no demand for Wheels in this market, and in the absence of sales it is difficult to give reliable quotations.

Louisville.

LOUISVILLE, KY., February 13, 1888.

Pig Iron.—There has been no change in price during the last week, and there are buyers for all Iron that is being offered for prompt delivery. Purchases for long delivery, however, are very few, as buyers were expecting a sharp advance, and purchases of Steel Rails by leading railroad companies have been disappointing; and as the Eastern market is carefully watched by them, they feel that until there is a change in New York prices there is no advantage in making purchases save for immediate needs. Old Wheels show some improvement, and Old Rails are a trifle off, as buyers expect with the opening of spring to have large offerings made at prices lower than they are able to obtain now.

Southern Coke, No. 1 Foundry	...	\$18.50 @ \$19.50
" No. 2	.....	17.50 @ 18.50
" No. 2 1/2	.....	17.00 @ 18.00
Hanging Rock, Coke, No. 1 Foundry	.....	19.00 @ 20.00
Hanging Rock, Charcoal, No. 1 Foundry	.....	22.50 @ 24.00
Southern Charcoal, No. 1 Foundry	.....	19.50 @ 21.50
Silver Gray different grades	.....	16.00 @ 17.00
Southern Coke, No. 1 Mill, Neutral	.....	16.00 @ 17.00
" No. 2	.....	15.50 @ 16.50
" No. 1 " Cold Short	.....	15.50 @ 16.50
White and Mottled, different grades	.....	15.00 @ 16.00
Southern Car-Wheel, standard brands	.....	20.00 @ 24.00
Southern Car-Wheel other brands	.....	20.00 @ 21.00
Hanging Rock, Cold Blast	.....	24.00 @ 25.00
Hanging Rock, Warm Blast	.....	30.00 @ 21.00

Birmingham.

BIRMINGHAM, ALA., February 13, 1888.

The Pig Iron market manifests a somewhat remarkable insensibility to the fair demand that exists all over the country. The volume of inquiry is sufficient to have mended matters a good deal in easier times, but just now it seems to have little or no effect upon the low level of prices. The latter are still sufficiently uncertain to make sellers apprehend a cut from any quarter any day, although the state of the producing interest does not seem to call for any such concession. There is not any distinct movement either way as yet, however. Several sales of from 1000 tons down have been made in the last week on a basis of \$15.50 for No. 1 Foundry; the bulk of the iron, however, being of "off" grades. Manufacturers almost unanimously deny that there is any good ground of apprehension of lower prices, pointing with especial confidence to the large prospective increase of consumption in comparatively new territory. The chief salesman of one of the local concerns is authority for the statement that half a dozen of his customers on the Ohio River on this side will extend their operations this year more than commensurably with the increase of Pig Iron production assured by the furnaces under way in this district. Local manufacturers are watching the Steel situation with keen interest, apprehending that continued low prices, by forcing furnaces off of Bessemer to Foundry and Mill grades, will be a factor of consequence in the Iron market.

Finished Iron.—In this line, too, prices still seem to be trembling in the balance. There is no solid visible reason for any decline, but prices are continually

cut in one part of the country or another. The Western mills, many of which are having to go out of their usual territory to dispose of their product, are reported to be especially addicted just now to this means of getting business. The sales of the local mills do not show any change of prices, however, even in Bars, which are still the weakest point in the market. Their Sheet product is practically sold up to the 1st of June, one of the largest contracts, closed only a few days ago, being for the bulk of the East Birmingham Corrugating Company's supply. There is a fair volume of business doing in Plates and Tank Iron at almost satisfactory prices. In Bars the local product will be increased some 30 tons a day shortly, the Alabama Rolling Mill Company's plant at Gate City being within two weeks of completion. It will be some 90 days yet before the Bessemer Rolling Mill Company's mills at Bessemer, a much larger enterprise, can go into operation.

Cleveland.

CLEVELAND, February 13, 1888.

Iron Ore.—There have been active rumors flying about concerning Ore negotiations, but not a ton has been sold, and it now seems quite probable that no sales will be made before March 1. Both buyers and sellers are watching the railroad companies. Orders for Steel Rails are being placed slowly, and the Ore companies and furnacemen are alike loth in making proposals. The vesselmen are losing confidence, and a \$1.60 rate from Ashland is not improbable. The Escanaba rate will not be above \$1.10. This schedule of lake freights will make lower prices for Ore quite possible.

Pig Iron.—Lake Superior Charcoal Iron is the only brand for which there is any appreciable demand. Car-Wheel manufacturers have bought all numbers in substantial quantities and at prevailing quotations. Otherwise the market is in an unsettled and unsatisfactory condition, with a limited inquiry and a very small margin of profit for the sellers. Additional reports have been received of sales of Ohio Iron at a sacrifice by manufacturers in need of money. Lake Superior Charcoals, all numbers, are quoted at \$21.50 @ \$22.50, and No. 1 Bessemer at \$20.85.

Bar Iron.—The demand continues excellent, but 1.80¢ is probably the highest figure paid by buyers during the week.

Old Rails and Wheels.—The market is extremely quiet. Buyers offer \$22 for Old Americans and \$20.50 for Wheels.

Barb Wire.—Manufacturers quote Galvanized at 3.75¢ and Painted at 3.15¢ f.o.b. cars at works.

The Iron Ore firm of Dalliba, Hussey & Co., of Cleveland, have been dissolved and have been succeeded by Dalliba, Corrigan & Co., Mr. H. P. Hussey retiring, and being succeeded by Mr. James Corrigan, who, with Mr. John Huntington, owns a large fleet of lake carriers. Mr. Hussey unites with Mr. G. Hoyt Pomeroy in the Pig Iron business, under the firm name of Hussey & Pomeroy, which firm will carry out all the Pig Iron engagements made by Dalliba, Hussey & Co.

Cincinnati.

Office of The Iron Age, Fourth and Main Sts., CINCINNATI, February 13, 1888.

Pig Iron.—During the week there has been a lull in the market for Pig Iron, but the less active movement has not been indicative of a weaker feeling; on the contrary, following a period of pressure, it is thought to reflect a firmer feeling on the part of producers. Statistics recently developed respecting the Iron trade lead

to the belief that an improved future is in store for makers of Iron, but much depends upon the carrying trade, and in proportion as the railroads are prosperous and generous will the Iron interest flourish or suffer. Cincinnati has been so very unfortunate of late in her experience is of a business and financial character that she is apt to regard the future—and even the present—with suspicion. The volume of business in Pig Iron, while admitted to be small, when compared with corresponding periods during last year makes a not unfavorable showing, and some firms have secured and are doing a larger trade now than then. Two weeks ago there were a few sales of round amounts, among them being 2000 tons Southern Car-Wheel Iron at \$23.85, several thousand tons of No. 2 Mill Iron at prices ranging from \$15.75 to \$16.10, 2000 tons No. 2 Southern Coke Foundry Iron at \$18, and 2000 tons Mixed Mill Bright and Silvery Iron on about the same basis. During the past week, however, the only trade of moment recorded is one lot of 1000 tons Ohio Gray Forge Iron sold by Columbus to Detroit at about \$17.25 delivered, or about \$16, cash, here, for No. 2. The current run of small orders, however, will aggregate a fair amount. No. 2 Mill Iron is now difficult to obtain under \$16.25, and No. 2 Foundry is more firmly held at \$18 @ \$18.25. While sellers, however, are inclined to present a firmer front buyers have not as yet changed their mode of thought or action. Quotations are as follows:

Hot-Blast Foundry.

Ohio Southern Coke, No. 1	.....	\$19.50 @ \$20.00
Ohio Southern Coke, No. 2	.....	18.00 @ 18.50
Ohio Southern Coke, No. 3	.....	17.50 @ 18.00
Ohio Soft Stone Coal, No. 1	.....	19.50 @ 20.00
Ohio Soft Stone Coal, No. 2	.....	18.00 @ 19.50
Mahoning and Shenango Valley	.....	20.00 @ 20.50
Hanging Rock Charcoal, No. 1	.....	22.00 @ 24.00
Hanging Rock Charcoal, No. 2	.....	21.00 @ 23.00
Tennessee and Alabama Charcoal, No. 1	.....	20.00 @ 21.00
Tennessee and Alabama Charcoal, No. 2	.....	19.00 @ 20.00

Forge.

Strong Neutral Coke	.....	17.00 @ 17.50
Mottled Neutral Coke	.....	15.25 @ 15.75
Cold Short	.....	16.00 @ 17.00

Car-Wheel and Malleable Irons.

Southern Car-Wheel	.....	23.00 @ 24.50
Hanging Rock, Cold Blast	.....	24.00 @ 25.00
Lake Superior Car-Wheel and Malleable	.....	22.00 @ 23.00

Old Rails and Wheels.—There has been a quiet but steady market for Old Rails at \$22.50, while Old Wheels are wanted at \$20.50 @ \$21 1/2 ton. Old Wrought Scrap is also in good demand and stronger, at about \$20.50 1/2 ton.

Nails.—There has been a moderate demand and steady market for small amounts. Iron, 10 @ 60d, sell at \$2 @ \$2.10, and do. Steel at \$2.10 @ \$2.20 1/2 keg, and other sizes at proportionate rates.

Manufactured Iron.—There has been a moderate order trade for Sheet, Plate and Bar Iron, which has been readily met at previous prices. Bar and Sheet Iron—Common Bar Iron, 2¢; Charcoal Bar Iron, 3¢; Sheet Iron, boiled, Nos. 10 to 27, 2.60¢ @ 3.30¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3 1/2¢ @ 4 1/2¢ 1/2 lb.

Detroit.

CHARLES HIMROD & Co., dealers in Iron, Detroit, Mich., report, under date of February 13, 1888, as follows: The market for the past week has been an active one, and although prices have not advanced they are very firm, and buyers are apparently more willing to place orders now for future delivery at ruling figures than makers are to accept them. The feeling among Lake Superior Charcoal Iron makers that prices will advance is much more general to-day than it was a few weeks ago, and in most cases they are asking 50¢ more 1/2 ton and no concessions are made even for desirable orders. The demand for Coke Irons is also active, and good Softeners

have the call. In nearly all cases prompt shipment is desired, showing that stocks in the hands of consumers are small. A number of deals have been made in Old Wheels, and on account of the scarcity in this market good prices have been obtained. We would report the market active, with a very favorable outlook, and would quote as follows:

Lake Superior Charcoal, all numbers.....	\$22.00 @ \$23.00
Lake Superior Coke, All Ore.....	21.25 @ 21.75
Lake Superior Coke, Cinder Mixed.....	19.00 @ 20.00
Standard Ohio Blackband.....	21.50 @ 22.00
Southern No. 2.....	19.50 @ 20.00
Southern Silvery.....	18.50 @ 19.00
Jackson County, Ohio, Silvery.....	20.50 @ 21.00
American Old Iron Rails.....	25.00 @ 26.00
Old Wheels.....	21.50 @ 22.00

Metal Market.

Copper.—Since our last report the market opened very quiet, Chili Bars being cabled £76. 15/ on Thursday, with sales of 325 tons, while here only 50,000 pounds changed hands at 16.45¢ for March delivery. On Friday London came £77, sales amounting to 775 tons, while none were reported among us, but on Saturday 100,000 pounds were sold at 16.50¢ for March delivery, 16.65¢ for April, and 16.60¢ for June, greater firmness being noticeable. On Monday London advanced to £77. 5/, with a turnover of 600 tons, the market in this city on the contrary being rather easier, sales summing up 100,000 pounds at 16.35¢ for spot and 16.50¢ for March. Copper shares were reported from Paris as having fluctuated a good deal last week, Rio Tinto showing a decline of 33 francs. It was, furthermore, cabled from there: "The Tharsis Copper Mine Company has agreed to sell to the Copper ring all the Copper it produces at £65 per ton. The ring undertake to refund to the company half of the profits of all that they may sell at above £65." Private advices do not confirm this report. In their report, dated February 1, Messrs. James Lewis & Son, Liverpool, remark: "Consumers decline to supply themselves until the market assumes a more settled aspect, while dealers have supplied themselves with a considerable quantity of Chili Bars at the lower prices. Business, therefore, except in Chili Bars, is almost at a standstill, and furnace material is practically unsaleable, except at a great sacrifice." The January import of Copper from the United States into Liverpool and Swansea was 2529 tons Fine, against 66 last year, 1351 in 1886, 2364 in 1885, 1377 in 1884 and 182 in 1883. The visible supply in England and France on February 1 was 45,681 tons Fine, against 61,284 last year. The export of Pyrites from Spain during the first 11 months of 1887 was 701,841 tons, against 621,834 in 1886 and 726,424 in 1885; of Precipitate it was 25,500 tons, against 24,794 and 24,962. The market closes quiet, with a sale of 300,000 lb of Lake, April delivery, at 16.60¢, 100,000 lb March, at 16.47½¢ @ 16.50¢ and 200,000 April at 16.65¢. The outside speculative element continues bearish, while dealers are picking up lots offered at moderate prices. For spot 16.25¢ is bid and 16.40¢ asked; February, 16.30¢ @ 16.50¢; March, 16.50¢; April, 16.65¢ @ 16.70¢; May, 16.55¢ @ 16.70¢, and June, 16.45¢ @ 16.60¢. It is rumored that the Calumet and Hecla Company have made an arrangement with the syndicate. The representative of the latter states positively that such is the case, but gives no particulars. It is stated that it is on the basis of some agreement to hold prices, with a readjustment, should the fire be extinguished. Against this is the fact that the policy so long adhered to by the company has been opposed to artificial methods of holding prices and to any speculative element. The company are about to complete their new kiln for making carbonic acid and will

then stop the injection of ammonia adopted as a measure for the interval of construction. The company have been selling their current output (2,500,000 lb and upward monthly) to manufacturers at a shade under market rates. The representative of the syndicate claims that it controls not less than an output of 138,000 to 140,000 tons, including the large Spanish companies, Chili, the Cape, and in this country the Anaconda, Boston and Montana, Taramack, Arizona, and Calumet and Hecla. The syndicate controls also refineries and rolling mills at Havre, Belleville and Dunquerque, France, in Austria, in Russia, and at Leghorn, Italy. It is of interest to note that Matte shipments to the latter point have begun. This ownership of refineries, it is urged, aids the Société des Métaux materially in its operations. Gigantic as they are, they inspire no confidence in the ability to carry the burden for years, but there seems to be little doubt that for the present and for some time to come the syndicate is master of the situation. Manufacturers here have bought little, but are reported to be feeling the market for supplies. Casting Copper is stated to be scarce, at 15¢ @ 15.25¢. Chili Bars close at £77. 10/, with the syndicate reported to be buying.

Tin.—The market has been quiet, and is still completely controlled by the syndicate, who have shipped for this country for March consumption 600 tons, and according to their representative here will need to ship about 500 to 600 tons more to cover the requirements. At the close 36.60¢ is bid, and 37¢ asked for spot; 36.70¢ and 36.95¢ respectively for February, 34.80¢ and 35¢ respectively for March, and 32.80¢ bid and 35¢ asked for April. Abroad the market closes with spot £166. 10/, and three months, £143.

Tin Plates.—Stocks here are somewhat better than they recently were, but they are still far from plentiful. The demand for Cokes continues active, but it is remarked that inquiries greatly outnumber actual transactions. Within a few weeks trade in Terns will begin to pick up; at present there is practically nothing doing. Prices on all lines are a shade easier than at our last writing. We quote large lots in New York as follows: Siemens-Martin Steel, Charcoal finish, \$5.10 @ \$5.30, ditto Coke finish, \$4.90 @ \$5; Terns, \$4.20 @ \$4.30; Bessemer Coke, \$4.75 @ \$4.80, and Wasters, \$4.62½.

Spelter.—The market is quiet, with Common Domestic at 5.32½¢ @ 5.50¢, and 5¼¢ @ 5½¢ for Sheet Zinc in round lots.

Lead.—Transactions have been confined to speculative dealings at 4.90¢ up to 4.95¢ at the Exchange, little business having been done outside of it. The whole foundation for the movement in question are the reports from abroad concerning negotiations going on there to form a syndicate. As yet absolutely nothing certain is known. It is possible that such a pool may be formed in a week, or it may lag for many weeks or be abandoned altogether. If it is not soon formed it may be questioned whether the speculators here can hold the market where it is in the absence of any buying by consumers. Concerning the probabilities of a syndicate abroad, the following may be stated: The Spanish production is in the hands of Rothschild, Sopwith, Figourea and De Neufville, of whom the first is said to be committed against such a step. In Germany, Mechernich with a product of over 25,000 tons annually is reported to be adverse, and the three Government works, Clausthal, Tarnowitz and Freiberg certainly cannot enter a pool. Stotberg is doubtful. Consumers in this country look upon the whole movement with suspicion, although they are known to be carrying small stocks only, and must

come in the market in March and April. We quote domestic 4.95¢ @ 5¢.

New York Metal Exchange.

The following sales are reported:

THURSDAY, February 9.	
10 tons tin, February.....	36.80¢
50,000 lb Copper, March.....	16.4¢
16 tons Lead, February.....	4.90¢
FRIDAY, February 10.	
10 tons Tin, April.....	33.10¢
240 tons Lead, April.....	4.90¢
50,000 lb Copper, March.....	16.50¢
50,000 lb Copper, March.....	16.55¢
50,000 lb Copper, March.....	16.50¢
48 tons Lead, March.....	4.90¢
25,000 lb Copper, spot.....	16.40¢
SATURDAY, February 11.	
25,000 lb Copper, March.....	16.50¢
25,000 lb Copper, April.....	16.65¢
25,000 lb Copper, June.....	16.60¢
25,000 lb Copper, June.....	16.60¢
50 tons Lead, April.....	4.95¢
MONDAY, February 13.	
50,000 lb Copper, March.....	16.50¢
50,000 lb Copper, spot.....	16.35¢
TUESDAY, February 14.	
50 tons Lead, March.....	4.95¢
150 tons Lead, April.....	4.95¢
WEDNESDAY, February 15.	
300,000 lb Lake Copper, April.....	16.60¢
25,000 lb Lake Copper, March.....	16.47½¢
75,000 lb Lake Copper, March.....	16.50¢
300,000 lb Lake Copper, April.....	16.65¢
10 tons Tin, March.....	34.20¢
65,000 lb Spelter, March.....	5.32½¢

Coal Market.

The market for Anthracite Coal is extremely dull, for while supplies are in good proportion for all except the steam sizes retail buyers are holding off lest they should be caught with high-priced Coal on a falling market. Within the past week there has been no change, prices remaining as follows: Free Burning White Ash Stove, \$5, alongside; Chestnut, \$4.75, f.o.b. Of Pea, there is none in market; spot has sold as high as \$4, alongside; Stove and Nut are plenty at \$5; Broken and Egg, \$4.40 @ \$4.50. The statistical position steadily improves. The output for four consecutive weeks compares as follows:

	Tons.
Week ending January 21.....	555,517
Week ending January 28.....	447,464
Week ending February 4.....	508,767
Week ending February 11.....	550,077

The increase for the last week is wholly in the Schuylkill region, which exports 40,000 tons, as compared with 25,000 the week before, while Lehigh's quota is 51,479 tons, a decrease of about 3000, and Wyoming furnishes 478,598 tons; a decrease of 10,790 tons. For the year to date the total is 3,298,244, as compared with 3,494,690 for the same time in 1887, a decrease of 196,000 tons.

The latest news from the Anthracite Coal regions shows that the miners' strike is fast approaching a crisis, Master Workman Lewis having ordered all engineers, firemen and pumpmen employed in the Schuylkill Region to be ready to go out at short notice. About 900 men altogether are included in this order, with the expectation that the Reading Company's property will be destroyed by flooding the mines. According to the views of Mining Superintendent Veith the danger of such a catastrophe is not imminent. "He explained that the 44 Reading collieries in the region employ about 500 engineers and firemen, from three to a dozen at each colliery. At Brookside 15 engineers are employed, more than at any other colliery. The engines run the breaker, hoist Coal, run the inclined planes on the culm banks, move the ventilating fans and pump water. At idle collieries most of these engines are already still, and only the pumping engines are at work. Consequently an order to stop would affect only the pumping engineers and firemen at idle collieries. Now every boss at a colliery has as a rule graduated from an engineer's position. Consequently Mr. Veith says it will be an easy

matter to fill the place of every engineer who obeys the order to quit work. Moreover, not all the engineers will obey such an order." Master Workman Lewis, on the contrary, expresses confidence that not only will the stationary engineers in the Skuykill mines vacate their positions, but that the scope of the strike will be extended so as to include the Wyoming miners, on Monday next, on the refusal of their demand for 15% advance in wages. The Knights concede that unless the Wyoming miners come out the battle is lost. The latter, however, are unorganized, and prominent operators profess to believe that a strike cannot be effective; that not more than 30 per cent. of the men are connected with labor organizations. At the annual meeting of the Schuylkill Navigation Company on Tuesday a settlement was reached which practically gives to the Philadelphia and Reading the ownership of all its property, rights and franchises.

William H. Tillinghast, president of the Lehigh and Wilkesbarre Coal Company, sent in his resignation.

W. De L. Walbridge was elected president of the American Coal Company.

The H. C. Frick Coke Company notified the labor organizations that the following named works would be blown out indefinitely next week: Henry Clay mines, 100 ovens; White, 200; Tip Top, 121; Foundry, 97; Eagle, 80; Summit, 142; Trotter, 464; Standard, 707, making a total of 1911 ovens. The continued scarcity of orders is assigned as the cause. The closing of the works will throw over 2000 men and boys out of employment.

The Pennsylvania Railroad report that 214,322 tons of Coal were carried over their lines east of Pittsburgh and Erie for the week ending February 4. The total Coal tonnage for the year thus far has been 1,127,276, an increase of 133,499 tons. The shipments from the mines of the Cumberland Coal region for the week were 49,366 tons, and for the year to that date 298,703 tons, an increase of 68,879 tons as compared with the corresponding period of 1887.

The Consolidation Coal Company report that in the year 1887 they mined and delivered 936,799 tons of Coal, against 675,652 tons in 1886.

The Philadelphia Gas Works contracted with the Westmoreland Coal Company for 300,000 tons of Coal, understood to be at \$3.84 per ton at the mines, as compared with \$3.75 last year.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from February 4 to February 11, inclusive, and from January 1 to February 11, inclusive, were as follows:

	Feb. 4 to Jan. 1	Feb. 11 to Feb. 11
Tons.	Tons.	Tons.
Pig Iron: G. W. Stetson & Co.	300	1,950
J. Abbott & Co.	300	500
Crocker Bros.	300	1,200
Jas. Williamson & Co.	300	900
N. S. Bartlett.	300	1,100
R. Crooks & Co.	100	500
Iron Ore: A. Earnshaw	658	658
Spiegel Eisen: J. A. Jansen.	3,732	3,732
Naylor & Co.	280	880
Steel: R. H. Wolff & Co.	25	79
W. F. Wagner	25	177
Lalanc & G. Mfg. Company.	25	35
J. Abbott & Co.	15	251
F. S. Pildich	7	42
C. F. Boker.	5	7
C. Hugill.	3	44
T. B. Codrington & Co.	2	2
Newton & S.	2	19
G. Lundberg.	1 1/4	1 1/4
Temple & Lockwood.	1	1
Steel Rods: J. Abbott & Co.	456	981
J. A. Roebeling's Sons	100	230
Naylor & Co.	16	1,562
Cary & Moen.	12	177
Steel Billets: J. Abbott & Co.	50	50
Steel Bars: A. M. McIn & Co.	20	85
Steel Plates: Hondolette & D.	5	57
Steel Slabs: J. Abbott & Co.	28	28
Naylor & Co.	1	1
Steel Sheets: Pierson & Co.	25	121
Steel Tubes: J. S. Lang & Co.	4	14
Scrap Steel: Naylor & Co.	70	170

Steel Forgings: Thos. Prosser & Son	140	544
Newton & S.	11	11
Steel Nail Rods: Bacon & Co.	5	48
Iron: J. Abbott & Co.	175	786
G. Lundberg.	14	365
E. G. Jacobus.	1	1
Iron Rods: J. A. Roebeling's Sons.	50	50
Scrap Iron: Geisenberger & Co.	565	565
D. Trowbridge & Co.	75	75
Iron Castings: Jackson & Co.	88	88
Iron River Rods: Muller Schall & Co.	50	50
Iron Pipes: W. H. Wallace & Co.	8	16
Rivet Rods: A. Heyn	77	77
A. M. McIn & Co.	50	50
G. Lundberg.	45	165
J. Abbott & Co.	36	251
Sheet Iron: T. B. Codrington & Co.	20	224
Charcoal Iron: Muller Schall & Co.	16	16
Wire Rods: Cary & Moen.	13	13
A. Heyn.	177	177
R. H. Wolff & Co.	55	60
Nail Rods: J. Abbott & Co.	5	105
Iron Bars: R. F. Downing & Co.	95	110
W. H. Wallace & Co.	18	18
Old Rods: Geisenberger & Co.	100	100
Martin's Metal: Bacon & Co.	20	20

Tin Plates.

	Boxes.	Boxes.
Phelps, Dodge & Co.	7,536	46,171
Dickerson, Van Duzen & Co.	7,171	39,553
R. Crooks & Co.	4,178	10,381
A. A. Thomson & Co.	4,136	21,614
T. B. Codrington & Co.	2,815	19,100
N. I. Cort & Co.	2,802	14,650
Naylor & Co.	2,737	14,134
Jas. Byrne & Son.	2,169	5,691
Pratt Mfg. Co.	1,350	14,445
Merchant & Co.	842	1,555
C. S. Mersick & Co.	660	1,286
H. Whittemore & Co.	471	2,346
Wolff & Keesling	400	400
Bruce & Cook.	334	8,348
Central Stamping Co.	310	310

Metals.

	Pounds.	Pounds.
Tin: Naylor & Co.	90,273	269,696
J. Abbott & Co.	55,977	1,158,382
Dickerson, Van Duzen & Co.	22,555	22,555
D. Thomson & Co.	22,418	59,125
Phelps Dodge & Co.	22,379	101,173
Crocker & Co. and Refining Comp'y	22,000	66,538
Funch, Edger & Co.	21,672	20,672
American Metal Company.	55,346	221,495
D. Trowbridge & Co.	5,530	5,530
Type Metal: Hendricks Bros.	22,440	22,440
	Casks.	Casks.
Antimony: Edw. Hill's Sons.	240	450
Phelps, Dodge & Co.	50	170
Hendricks Bros.	34	34
D. Thomson & Co.	17	17

Hardware, Machinery, &c.

Barbour Bros. Co., Mach'y, pkgs., 29	
Boker, Hermann & Co., Mdse., cs., 26; Arms, cs., 27	
Clark, G. A. & Co., Mach'y, cs., 22	
Cordova, G. & Co., Mach'y, pcs., 3	
Curley, J. & Co., Mdse., case 1	
Olge, A., Mdse., cs., 3	
Foley, E., Mach'y, cs., 7	
Field, Alfred & Co., Mdse., cs., 13	
Graef Cutlery Co., Cutlery, cs., 1	
Hart, A. H. & Co., Mach'y, pkgs., 10	
Junge, F. W. & Co., Mdse., cs., 8	
Kastor, A., Mdse., cs., 10	
Merch. Desp. Co., Arms, cs., 3	
Mott, J. L. Iron Works, Mdse., cs., 1	
Rennie, W. H., Mach'y, box 1	
Schoverling, A., Arms, cs., 12	
Schoverling, Daly & Gales, Arms, cs., 16; Mdse., cs., 2	
Sellers, W. B., Mdse., cs., 2	
Townsend & Co., Mach'y, cs., 4	
Taylor, Thos., Mdse., cs., 6	
Wiebusch & Hilger, Mdse., cs., 33; Chains, cks., 25	
Wright, Peter & Sons, Mach'y, cs., 2	
Oreer: Mach'y, cs., 240; pcs., 4	

Iron and Metals Warehouse from February 4 to February 11, inclusive: Tons.

	Feb. 4 to Feb. 11	Jan. 1 to Feb. 11
Pounds.	Pounds.	Pounds.
Copper: J. Abbott & Co.	1,165,229	2,854,377
Lewisohn Bros.	345,600	568,100
American Metal Co.	112,500	1,224,200
G. H. Nichols.	111,115	111,115
J. Bruce Ismay.	112,000	112,000
F. A. Lomal.		2,481,000
S. Mendel.		336,000
Ledoux & Co.		2,100
Phelps Dodge & Co.		130,664
Muller, Schall & Co.		235,000
Copper Queen Con. M. Co.		224,031
J. Kennedy, Tod & Co.		112,025
H. Becker & Co.		1,250
Orford C. & S. Rfg. Co.		224,881
Robt. M. Thompson.		125,000
Thos. J. Pope, Sons & Co.		115,000
Copper Matte: Williams & Terhune.	2,364,959	9,358,833
C. Ledoux & Co.	184,920	386,520
American Metal Company.	361,775	
Old Copper: Henderson Bros.	37,638	37,638

Paints.

Black, Lamp—Coach Painters'...	... 22 @ 24¢
" Ordinary	... 6¢
Black, Ivory Drop, fair	... 12 @ 15¢
" best	... 23¢
Black Paint in oil... egs, 8¢; assorted cans, 11¢	
Blue, Prussian, fair to best	... 40 @ 55¢
" " in oil	... 45 @ 55¢
" Chinese dry	... 70¢
" Ultramarine	... 18 @ 30¢

Brown, Spanish	14¢
Van Dyke	10 @ 12¢
Dryers, Patent American, ass'd cans, 9¢; kegs, 7¢	
Green, Chrome	15 @ 25¢
Green, Chrome in oil	14 @ 18 @ 25¢
Green, Paris in oil	good, 30¢; best, 35¢
Green, Paris in oil	good, 30¢; best, 35¢
Iron and Bright Red	... 24¢
Iron Paint, Brown	... 14¢
Iron Paint, Purple	... 3¢
Iron Paint, Ground in oil, Bright Red	... 64¢
Iron Paint, Ground in oil, Red	... 54¢
Iron Paint, Gr und in oil, Brown	... 54¢
Iron Paint, Ground, Purple	... 6¢
Litharge	... 34¢
Mineral Paints	... 2 @ 4¢
Orange Mineral	... 10¢
Red Lead, American	... 64¢
R-d Venetian (Eng.) dry	\$1.65 @ \$1.70
Red Venetian in oil	as-f'd cans, 11¢; kegs, 8¢
Red Indian Dry	... 9 @ 12¢
Rose Pink	... 10 @ 13¢
Sienna, American Raw, powdered	... 4¢
Sienna, Burnt, powdered	... 4¢
Sienna, Burnt, in oil	... 10 @ 16 @ 20¢
Sienna, Raw	... 11 @ 15 @ 25¢
Umber, Burnt, powdered	... 4 @ 8¢
Umber, Burnt, in oil	... 9 @ 12 @ 15¢
Umber, Raw, powdered	... 4 @ 74¢
Umber, Raw, in oil	... 9 @ 12 @ 15¢
Vermillion, Chinese	... 90¢
Vermillion, English	... 70 @ 71¢
Vermillion, American Common	... 15¢
White Lead, American pure dry	... 6¢
White Lead, American pure dry, in oil	... 7 @ 14¢
White Paris, English Prime	... 2 @ 24¢
Yellow Ocher, French	... \$1.15
Yellow Ocher, French, in oil	... as-f'd cans, 11¢; kegs, 8¢
Yellow Ocher, Vermont	... in casks, 14¢
Yellow Chrome	... 17 @ 27¢
Yellow Chrome, in oil	... 14 @ 18 @ 25¢
Zinc White, American No. 1, dry	... 5 @ 6¢
Zinc White, American No. 1, in oil	... 9¢
Zinc White, French (Paris Dry)	... 64¢ @ 74¢
Zinc White, French, in oil	... 10 @ 11¢

Sundries.

Asphaltum, Cuban, per bbl.	54¢ @ 64¢
Asphaltum, Egyptian	8 @ 94¢
Benzine, 62°, per gal.	84¢ @ 94¢
Coal Tar	per bbl, \$3.00 and \$4.00
Chalk, per 100 lb.	14¢
Chalk, Block	3¢
Crucibles No. 14 and upward, per number	35¢
Grain Emery, 300 lb kegs	4 @ 44¢
Flour Emery, finest quality	24¢ @ 29¢
Glue, White	18 @ 35¢
Glue, Sheet	13 @ 20¢
Glaziers' Points, Zinc, per box	\$4.75
Gum, Copal	36¢
Gum, Damar	25¢
Gum, Shellac, English	30¢
Gum, Shellac, English, dark	25¢
Mineral Wool, ordinary, per lb.	1 @ 14¢
Mineral Wool extra	3 @ 34¢
Naphtha, 70°	9 @ 10¢
Naphtha, 76°	9 1/2 @ 10 1/2¢
Pumice Stone, selected lumps	3 @ 6¢
Pumice Stone, powdered	2 @ 24¢
Pine Tar, bbls	\$2.10 @ \$2.12 1/2
Pitch	\$1.10
Plumbago, E. I. Po., per lb.	4 @ 6¢
Plumbago, American, per lb.	6 @ 10¢
Plumbago, Gun Powder Glazing, per lb.	10¢
Plumbago, Shot Polish, per lb.	10¢
Putty, in bladders	24¢
Putty, in bulk	19 1/2 @ 2¢
Rosin, Strained and Good	\$1.35 @ \$1.40
Rosin, E. & F.	\$1.42 1/2 @ \$1.50
Rosin, G. & H.	\$1.55 @ \$1.62 1/2
Rosin, I. & K.	\$1.75 @ \$1.85
Rosin, M. & N.	\$2.00 @ \$2.25
Spirits Turpentine, per bbl	40 @ 43¢
Stove Polish, Dixon's	per gross, \$6.00
Stove Polish, Rising Sun	5.50
Stove Polish, Gem	4.50
Stove Polish, Jet Black	3.50
Waste, No. 1 Cop	84¢
Waste, No. 1 White Machine	84¢
Waste, No. 2 White Machine	84¢
Waste, No. 1 Colored	84¢
Waste, No. 2 Colored	84¢
Waste, Washed Machine	84¢
Whiting, Spanish, per 100 lb	50¢

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	... \$0.10 @ \$0.12
Light Copper	... @ .09
Copper Bottoms	... @ .08
Brass, Heavy	... @ .08 1/2
Brass, Light	... @ .06 1/2
Composition	... @ .12
Lead, Heavy	... @ .03 1/2
Tea Lead	... @ .03
Zinc	... @ .03 1/4
Wrought Iron	per ton, 18.00 @
Light Iron	per ton, 10.00 @
Stove Plate Iron	per ton, 10.00 @
Machinery Iron	per ton, 13.00 @ 13.50
Grate Bars	per ton, 7.00 @
Old Rubber	... @ .55 1/2
White No. 1	... @ .03 1/2
White No. 2	... @ .01 1/2
Canvas, Linen, No. 1	... @ .04
Canvas, Cotton, No. 1	... @ .04 1/2
Canvas, No. 2	... @ .02 1/2
Secois	... @ .01
Soft Wooleens	... @ .01 1/2
Mixed Rags	... @ .01
Runny Bagging, No. 1	... @ .12 1/2
Auto Butts	... @ .02 1/2
Book Stacks	... @ .01 1/2
Newspapers	... @ .00 1/2
Waste Paper	... @ .00 1/2
Hemp Twine	... @ .02 1/2
Sisal Baling Rope	... @ .03

General Hardware.

During the past week there have been few changes in price sufficiently marked to call for mention. The market is characterized by a fair degree of activity, with an increased demand, which is doubtless still somewhat curtailed by the heavy snows in different parts of the country. The orders that are received by manufacturers and their representatives are referred to as for the most part covering small assortments, with a good proportion of seasonable goods.

NAILS.

A meeting of the Eastern Nail manufacturers was held at Philadelphia last week, at which the proposal to limit production, which was so industriously worked at last summer, was again brought up. It is probable that the continued depression in the Nail trade since then has favorably disposed to the project some of the makers who were opposed to it then. Indeed it is reported that the mills of the Upper Susquehanna have for some time been working under an arrangement to limit production. The general plan proposed is similar to that in force among the Steel Rail mills. The probable requirements of the market are to be allotted among the mills according to the number of their machines, their construction and age. The arrangement, while meeting with quite general approval at Philadelphia after a session lasting 12 hours, is now being discussed further in detail at a meeting in progress in this city. It is not yet finally consummated, however. The leading principle appears to be to let prices alone, but to keep the output within the requirements of the market. The Nail business has certainly not been remunerative for a long time past; in fact, losses are admitted by some of the best equipped and best managed works. Past experience ought certainly to guard the Nail manufacturers against any attempts to force prices even indirectly to unduly remunerative limits, since a good share of the troubles of the makers now are due to the stimulating effect upon production of unduly high prices in past years. The absence of co-operation by the Western mills, too, will prevent any marked advance. The trade is inclined to view this last effort with some doubts, inspired by the spectacle of sharp rivalry among many producers for a long time. The manner in which Nails are handled as a leader down to the smallest retailer, or are used to cover concessions in other lines of Hardware, is another source of demoralization. The trade generally is inclined to look with approval upon efforts made to drag the Nail business out of its present rut, but it will require strong evidence of harmony to convince it that makers are acting in concert. The New York market is quiet, with sellers asking \$2.10 from store for small lots of Iron Nails.

The annual statistical report of the Atlantic States Nail Association shows the following figures:

	Production.
	Kegs.
January.....	268,748
February.....	271,290
March.....	232,145
April.....	221,139
May.....	147,463
June.....	201,631
July.....	131,497
August.....	211,646
September.....	244,750
October.....	247,170
November.....	239,284
December.....	222,829
Total, 1887.....	2,609,592
Total, 1886.....	3,128,981
Total, 1885.....	3,046,110
Total, 1884.....	2,515,642
Stocks, January 1, 1888.....	359,165
Stocks, January 1, 1887.....	304,433
Stocks, January 1, 1886.....	348,095
Stocks, January 1, 1885.....	284,754

The works in the Atlantic Nail Association have 1896 machines. Estimating those not reporting at 28,142 kegs, the total production of the Eastern mills was 2,727,734 kegs.

	Kegs.
Western Association, 3273 machines, in 1887.....	3,385,025
Eastern Association, 1896 machines, in 1887.....	2,727,734
Total.....	6,112,759

The machines reporting were 5169, but as Mr. Swank makes the number in existence 6350 machines, it is likely that the product of the machines not reporting will swell the total to at least 7,000,000 kegs.

The Atlantic Nail Association have issued the following card:

At a meeting of the association held February 9, the following changes in the schedule of extras were unanimously adopted, to go into effect immediately:

The base to be 10d to 30d, no extra.
40d, 50d and 60d, to be 25 cents per keg above base.

3d Fine to be \$1.75 per keg above base.
Clinch Nails to be \$1 above same length common Nail.

Each half keg to be 15 cents extra.

The above changes leave the extras above base stand thus:

8d and 9d Nails, Fencing, Sheathing, 40d, 50d, 60d Nails and all Spikes, 25 cents.

6d and 7d Nails, Fencing and Sheathing, 50 cents.

4d and 5d Nails, Fencing and Sheathing, 75 cents.

3d, 3½d and 4d Fine, \$1.50; 3d Fine, \$1.75; 2d, \$2.25

Cooper, Tobacco and Slating, to be 50 cents above same length common Nail.

Flooring, Casing and Box, to be 75 cents above same length common Nail.

Clinch Nails and Finishing to be \$1 above same length common Nail.

Fine Finishing, to be \$1.25 above same length common Nail.

Each half keg, 15 cents extra.

BARB WIRE.

To-day a conference is being held at St. Louis between Washburn & Moen and E. L. Ellwood, the owners of the Barb Wire patents and the licensees. At meetings held at Worcester some time since those who control the patents were at first inclined to make no change in the royalty in consequence of the Shiras decision, while, on the other hand, the licensed manufacturers decided to stop paying royalties altogether. At a later meeting a more conciliatory spirit prevailed, and some concessions were held out. The St. Louis conference may lead to a final settlement. The royalty was only 15 cents per 100 pounds, previous to the decision, and with the sharp competition for business the absurdity of the statements that a cessation of payment would greatly cheapen Barb Wire is apparent.

MISCELLANEOUS PRICES.

The Harvey W. Peace Company, Brooklyn, E. D., N. Y., have issued a new catalogue of their Saws, which bears date January, 1888. It is a handsomely printed pamphlet of more than 70 pages, representing the extensive line of Saws of which they are manufacturers, and contains an excellent portrait of Mr. Peace, which will be valued by his many friends and appreciated by the trade at large as representing one of the most skillful and prominent Saw-makers of the country. The company allude in their circular to the trade to the fact that they have materially increased their facilities for manufacture by the introduction of special machinery, and graceful acknowledgment is made of the testimonials which have been received from the trade in regard to the quality of their goods. The catalogue is accompanied by the following discount-sheet, terms, 60 days, or 1 per cent. discount for cash in 30 days from date of invoice:

Pages 10 to 14 inclusive, Circular Saws.....	45 %
Page 15, Mandrels.....	25 %
Page 16, Machine Knives, &c.....	N-t
Page 17, Saw Jointer.....	25 %
Page 18-28, Mill, Crosscut, &c.....	45 %

Pages 29-58, Hand Saws, &c.....	25 %
Page 59, Butcher Saws.....	Net
Pages 60-71, Kitchen and Wood Saws &c.....	25 %
Page 71, Saw Sets.....	40 %

Le Page's Liquid Glue and Cement Company, Gloucester, Mass, issue the following list of their Glues, which is subject to a discount of 25 per cent:

Small Family, per doz.....	\$1.00
Large Family.....	1.50
½ Gross Assortment.....	9.00
1 Gross Assortment.....	18.00
Half Gall, per doz.....	1.50
Gill, per doz.....	2.00
Half Pint, per doz.....	3.00
Pint, per doz.....	5.00
Quart, per doz.....	8.50
Half Gallon, per doz.....	13.50
Gallon.....	24.00

The following are the prices of the Sap Buckets described on page 306, and manufactured by A. H. Whiting, successor to Whiting & Co., 468 and 470 Cherry street, New York:

	Per dozen.
10 quart.....	\$2.50
12 quart.....	2.75

The Arcade Mfg. Company, Freeport, Ill., for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, are putting on the market a line of Coffee Mills embodying special features, some of which are referred to in the illustrated article on page 306. Their list is as follows, the discount being 50 per cent., and an additional 2 per cent. for cash.

Imperial, No. 147, per doz.....	\$12.00
Imperial, No. 157, per doz.....	16.00
Imperial, No. 167, per doz.....	9.50
Imperial, No. 177, per doz.....	11.00
Imperial, No. 187, per doz.....	19.00
Favorite, No. 47, per doz.....	11.00
Favorite, No. 57, per doz.....	15.00
Favorite, No. 67, per doz.....	8.50

D. R. Sperry & Co., Batavia, Ill., issue a sheet of discounts for the present season, which apply to their annual price list of 1887-1888. Terms 90 days, 3 per cent. off for cash within 10 days:

Caldrons, page 13.....	40&5 %
Caldrons, in lots of five or more, if shipped direct from the factory.....	45&5 %
Castings for setting Caldrons, pages 18-19.....	40&5 %
Bakers' Oven Castings, page 20.....	40&5 %
Sugar Kettles, page 16.....	50 %
Sugar Kettles, in lots of ten or more, if shipped direct from factory.....	55 %
Extra Finished Hollow Ware, pages 24, 25, 26, 27 and 28.....	50 %
Plain Hollow Ware (Tea Kettles, Ham-Boilers, Long Pans, &c.).....	55 %
Laundry Stoves, page 9.....	40 %
The Dairy Maid, pages 10 and 11.....	35 %
Farm Boilers, 4, 5, 6, 7, 8.....	35 %
Mauls, page 21.....	60&5 %
Wood-Face Mauls, page 21.....	35 %
Coffee Roasters, page 23.....	40 %
Bake Ovens, Improved Covers, page 22.....	50&5 %
Drug Mortars, page 30.....	30 %
Miscellaneous Goods, pages 32, 33, 34.....	35 %

A Western Hardwareman sends us from an invoice of 1867 the following prices on leading goods, which will be of interest, as giving a basis for a comparison of prices at that time with those current at present:

	Per doz.
R. R. Picks.....	\$15.00
Heavy Strap Hinges, 6 and 8 inches, per pound, 15 cents.	
Washita Oil Stones, per pound, 75 cents.	
Clothes Wringers.....	83.00
L. H. Strapped Forks, 4 tine.....	13.70
Blood's Axes.....	15.50
Maydole's A. E. Hammers, No. 1, ½.....	12.50
10-inch Drawing Knives.....	10.20
Mineral Door Knobs.....	2.75
Wrought Narrow Butts, same list as now, add 10 per cent.	
Taper Files, 4½ inch.....	1.70
Taper Files, 5 inch.....	1.90
Taper Files, 6 inch.....	2.60
5-inch Screw Drivers.....	3.50
C. S. Augers, 1 inch.....	6.20
C. S. Augers, 1½ inch.....	9.00
C. S. Augers, 1¾ inch.....	12.60
No. 40, Pocket Levels.....	2.00
Plumbs and Levels.....	17.60
10-inch Bevels.....	6.50
Disston's No. 7 Rip Saws.....	29.50
Saw Frames.....	2.25
Stebbins' Molasses Gates, No. 2.....	6.00
Stebbins' Molasses Gates, No. 3.....	6.75
No. 2 Iron Squares.....	5.00

OBITUARY.

John Nazro, one of the pioneer Hardware merchants of Milwaukee, Wis., died in that city on the 6th inst., aged 61 years. He was born on the Island of San Domingo, although of American parentage. He went to Milwaukee in 1847 and began his Hardware and Iron business. In 1860 the firm name was changed to Joslin, Nazro & Co. Under Mr. Nazro's energetic management the business attained great proportions. He built the block at the southeast corner of Reed and South Water, which has an area of nearly 3 acres and was at that time the largest Hardware store in the world. In 1880 he retired from the wholesale Hardware trade, and of late years has been in the grain commission business. He had been a member of the Milwaukee Chamber of Commerce since 1860, and served as vice-president one year. He was one of the active organizers of the Merchants' Association, and served as president three years. He was also Collector of the Port of Milwaukee from 1876 to 1880. Mr. Nazro was widely known and universally respected, and his counsel was sought by the most prominent citizens in relation to public and business questions.

Thomas Carr, of the prominent Hardware firm of C. Carr & Sons, Chicago, died on the 6th inst. after a brief illness. This firm conducts four Hardware stores located in different parts of Chicago. Thomas Carr was the manager of the store in Lake View. Although he was only 32 years of age he was conspicuous in both social and business circles, and took an active interest in public affairs.

In a recent issue we announced the death at New York, on the 30th ult., of A. E. Henderson, of Fargo, one of the most prominent Hardware merchants of Dakota. Through the courtesy of H. Harrington, of Fargo, we are enabled to give a brief sketch of the life of the departed merchant. He was born in Indiana on February 10, 1845, and learned the trade of tinner. In 1861 he enlisted in Company F, 18th Indiana Volunteers, and served through the war. He then located at Alexander, Minn., where he plied his vocation as tinner for two years, removing thence to Moorhead, Minn., and opening the pioneer Hardware house in that place. Subsequently he discerned enlarged opportunities at Fargo and transferred his business to that enterprising city, establishing the first Hardware store at that point. He not only developed a large trade in his immediate business, but he made judicious investments in real estate, and became quite wealthy. His residence in the Red River Valley only covered a period of 15 years, yet he was one of the early settlers in that region and enjoyed a resulting acquaintance which made him very prominent throughout its whole extent. He is referred to as strictly honorable in all his dealings, ever ready to contribute liberally to any enterprise inaugurated for the benefit of the city, leaving behind him an unsullied reputation. His remains were interred at Moorhead with Masonic ceremonies.

TRADE TOPICS.

An Illinois Hardwareman, whose opinion is entitled to weight, writes as follows with reference to the question as to the desirability of marking packages of Tacks with their actual contents, as proposed by J. F. Harris, Jr., of the Auburn Tack Company, whose communication relating to this matter has been regarded with so much interest. After saying that he does not think the proposed plan feasible or necessary, our correspondent adds:

I do not think it well to post or educate the consumer in the trifling matter of a paper of Tacks as to how many it contains or how

much it weighs, for in these days of low prices and competition the retail merchant has much to contend with, and the consumer generally gets the full value of his money, and were the weight stated on each paper in many cases he would argue as to the price charged per paper in proportion to the price per pound.

He then illustrates his position by a reference to the trouble he has already experienced in selling Wire Nails on the packages of which the quantities are marked:

I have already experienced some annoyance in the retailing of Steel Wire Brads, put up in dozen packages, each dozen containing three pounds and each paper marked, quarter pound for the smaller sizes and half pound for larger sizes, containing 6 pounds per dozen papers. I retail all sizes at 10 cents per paper, so that the goods cost the consumer in one case 40 cents per pound and in the latter 20 cents per pound. He gets much more in a paper than he gets in Iron Brads, but, seeing the weight on the paper, he says he can buy the Wire Brads at 15 cents per pound. He probably would have no use for the quantity, and does not realize the extra expense in putting up in paper, or the convenience, but thinks he is being robbed. I remember the time we used to waste in retailing 5 or 10 cents' worth of Hair Wire before it was put on spools. Some customers want to buy Tacks by the pound, and they are so sold by some retailers, but I do not advocate selling Tacks in that way, except to manufacturers, who use a great many. I think the present system of putting up Tacks, provided that factories adhere to the rule as they understand it, is the best. Those who do will get the trade, and the rest are very liable to have their goods shipped back. For my retail trade I have a sample card of Tacks, Brads, &c., which I show to my customer, who selects the size he wants and is satisfied.

Another correspondent refers as follows to Mr. Harris's proposed method of putting up Tacks:

We are favorably inclined to the style of package Mr. Harris suggests. The present method is very unsatisfactory, both to retailers and consumers.

In the letter which we print below a Philadelphia Hardwareman discusses the Tack question, indicating at the same time the manner in which he considers that Tacks should be marked:

I think it is wisdom on the part of manufacturers of any article to take advice from retailers in reference to the packing or handling of goods made by them, and more especially in the case of Tacks, where the opinion seems to be unanimous for some change. It seems foolish for persons to say the old plan is good enough. Long ago we did away with the pounds, shillings and pence of our grandfathers, and so it will be with the present style of marking Tacks. To my mind there is no greater nuisance to the trade at present than the way Tacks are marked and sold. The label signifies nothing, as any one can see by opening a paper of 6, 8 or 10 ounce Tacks of two or three different makes. You will find them different only in thickness, the 6 and 8 ounce oftentimes being the same length. The Wire Nail-makers got hold of the right plan when they commenced to classify the Nails according to their length and thickness, as you will find on looking at the list of the HP Nail Company. Theirs run from 3-16 to 5 inches long, and there is no trouble in giving a customer what he wants. In my opinion Tacks should be numbered the same way, say, 100 Tacks, $\frac{3}{8}$ inch, light, or 200, Tacks $\frac{1}{2}$ inch, heavy. A good many of my customers when asked what size Tacks, 6, 8 or 10 ounce, reply that they do not know anything about ounces, but want them about $\frac{1}{4}$ or $\frac{1}{2}$ inch long, as the case may be. Many times we have to open three or four papers to find out what they want, as the different makes vary so much that unless you note the papers the Tacks are taken from you cannot tell about the size in ounces. In these days of small profits and quick sales we need simplicity and convenience. Let us have the packages full. The habit of putting two or three sizes in the same size box makes persons say that we do not give them what they are entitled

to, or that we have been imposed upon, or are trying to impose on them. Push on the good work and let us know what we are buying and then we can sell it right.

I hope, too, the many colored labels will be discontinued, and only white labels with black letters used. Many a storekeeper can tell how he has strained his eyes trying to make out the sizes marked on the pink, green, blue, yellow, red or brown label.

The following letter of an Indiana Hardware man refers to and indicates the tendency of the trade toward the sale of Tacks in bulk:

The present system of putting up Tacks, which has been in use so long and is thoroughly understood by merchants generally, is entirely satisfactory. Manufacturers should, however, put up honest full and half weight papers. Only Carpet Tacks should be put up in quarter weights. We find our retail Tack trade running largely to bulk goods, where they get just what they pay for.

ITEMS.

The George Worthington Company, Cleveland, Ohio, have issued their spring circular. It illustrates some of their seasonable goods, Steel Goods being given a prominent place. Shovels and Spades, Post-Hole Diggers, Wheelbarrows, Lawn-Mowers, Door and Window Screens, and Refrigerators are among the other specialties represented.

The Gilbert & Bennett Mfg. Company have removed their Chicago warehouse from 228 Lake street to 148 Lake street. The new building will give them greatly improved facilities for the transaction of their business, having four stories and a basement.

Announcement is made, under date of February 1, that the firm of Wiebusch & Hilger having been dissolved by the decease of Frederick Wiebusch, the business and capital invested in it have been incorporated under the style of Wiebusch & Hilger, Limited. The corporation will retain the same connections and facilities as of old, and will endeavor to merit the confidence which has in the past been extended to the firm.

Fayette R. Plumb, Philadelphia, Pa., is issuing an exceptionally complete and elaborate catalogue of the line of Hammers, Edge Tools, Sledges, Blacksmiths', Miners', and Railroad Track and other Tools of which he is manufacturer. It is an exceedingly handsomely printed catalogue of 320 pages, on superior paper, from the press of Rand, Avery & Co. The pages have elaborate and varied borders with appropriate designs, printed in a delicate tint. Illustrations of the different tools, many of which are full size, and in representing which gold or colors are frequently used, occupy alternate pages, the opposite page being devoted to price lists and descriptions of the goods, which are given in unique form, a distinct mention being made, for example, under Hammers, of the brand, style, finish, material, method of packing, &c. The volume opens with illustrations which give in pictorial form the history of the concern, showing the original factory operated by water power, when the business was started by Jonathan Yerkes in 1856, and others indicating the subsequent stages of its growth as the concern became Yerkes & Plumb, and finally Fayette R. Plumb, different views of whose extensive works are given. An unusually complete and satisfactory telegraph code occupies six pages of the catalogue, which will doubtless be appreciated by the trade in making inquiries or placing orders. Fac-similes of medals and certificates awarded to this line of goods at different expositions are given, as well as illustrations of the different labels used. A classification also is given of stamps, Mr. Plumb's own brand, or "Yerkes & Plumb

Cast Steel," applying to goods made of the very best material and warranted, which will always be replaced with new ones where satisfaction is not given; "Vulcan Tool Company Cast Steel" applies to goods made from good material but not warranted; and "Q. C. Mfg. Company Cast Steel" applies to goods made from stock lower than Vulcan tools, but well finished. Mr. Plumb explains that the rapid growth of the business since the erection of the present works enables him to employ foremen in each department who are held strictly accountable for all goods coming under their supervision. Attention is also called to the new goods which have been added since the publication of the last catalogue. This volume, which is certainly among the finest and most elaborate of Hardware catalogues, is very creditable to Mr. Plumb, and will be appreciated by the trade, who are to be congratulated as having it placed at their disposal.

The trade will learn with regret of the embarrassment of W. I. Negus & Co., 17 Warren street, New York, who for the protection of their creditors deemed it best to make an assignment on the 14th inst.

R. I. Birkmayr & Co., Sandusky, Ohio, have sold out their business in that city to Sanderson & Foster, and have bought out the stock of Ernst Stoeltzing, 1415 Grand avenue, Kansas City, Mo., which will be their address after March 1, and where they will be glad to receive from manufacturers price lists, circulars, &c. Their business will comprise Stoves, Tinware, Builders' Hardware, Bronze Goods, &c.

G. I. Mix & Co., Yalesville, Conn., and 82 Chambers street, New York, issue a compact and well-printed catalogue and price list, in which they illustrate their Britannia, Steel and Iron Spoons, Ladles, Skimmers, Tea and Coffee Pots, Chisels, Drawing Knives, &c.

The second annual catalogue, 1888, of the Hollenbeck Lock and Knob Company, Syracuse, N. Y., has been issued. It is more than double the size of their former issue and represents their enlarging line of Locks and Knobs. Their Expanding Spindle Door Knob, of which we gave an illustrated description, is prominently represented.

Upson, Walton & Co., 159-163 River street, Cleveland, Ohio, have issued their Wire Rope list No. 9, in which list prices are given on their different lines of Wire Rope and also on Steel Wire Switch Ropes, Wire Rope Thimbles, Clamps, Fixtures, &c.

Chas. Millar & Son, Utica, N. Y., issue a price list of goods for making maple sugar, including the Willis Sap Spout and Portable Arch, Sap Buckets, Syrup Cans, Screw Can Tops, Todd's Patent Cover, Sap Pan Iron, &c.

O. S. Rixford, East Highgate, Vt., issues a very neatly printed catalogue of his Axes, Scythes, Snaths, &c., in which cuts of the different tools and patterns occupy the left-hand page, with description on the opposite page. In the introductory circular it is mentioned that the manufacture of this line of goods was established in 1812, having been in successful operation continuously to the present time. The success that has attended the manufacture of Scythes during these 75 years is alluded to and also the quality of the Axes, which have more recently been put on the market. Mr. Rixford states that he sells only to one merchant in a place and not to jobbers, thus protecting his customers who have worked up a trade on these goods, which can be procured only through authorized agents or direct from factory.

The friends of Joseph Paull, Houghton, Mich., will be gratified to learn that he is

recovering from the accident, from the effects of which he has suffered for the past few weeks.

The George D. Winchell Mfg. Company, Cincinnati, Ohio, have issued a handsome catalogue of their Imperial Water Coolers, of which six styles and grades are represented. Some of this series are made with Galvanized Iron chamber, and others with Cast Iron porcelain-lined chamber. The Gate City Stone Filter is also illustrated, and letters given from some of the parties who are selling the Imperial Water Coolers, in which testimony is borne to their qualities.

The Phoenix Caster Company, Indianapolis, Ind., in their recently issued catalogue relating to their line of Martin's Patent Caster, represent in full size the different patterns they are making, even up to their Casters for warehouse trucks, the diameter of the wheels of which is 4½ inches. The special features of the Casters are also explained and a convenient price list given.

The Tucker & Dorsey Mfg. Company, Indianapolis, Ind., have issued a new catalogue. It relates to their Tucker's Alarm Tills, Daisy Stove Trucks, Hoosier Saw Bucks, Saw and Kraut Cutters, Towel Rollers, Hat and Coat Racks, &c. In their preface they call attention to their improved facilities for manufacturing. Their factory, which was destroyed by fire last November, has been rebuilt on a large scale and equipped with the latest improved machinery.

Sise, Gibson & Co., 100 Chambers street, New York, have been appointed agents for the American Bit Brace Co., Buffalo, N. Y. As agents also for the Underhill Edge Tool Company, Nashua, N. H., they have been given the sole agency for the sale of their goods in the States of New York, New Jersey and Pennsylvania.

The Hilger Hardware Company, St. Louis, at a recent meeting, elected the following officers: E. Hilger, president and treasurer; G. Krug, vice-president, and Chas. Hilger, secretary. This election was occasioned by three members of the company retiring and part of the shares changing hands.

S. E. Brown has opened an office in Room 512, Phenix Building, corner Clark and Jackson streets, Chicago, to represent the Findlay Iron and Steel Company and the Cleveland Hardware Company, manufacturers of Bar Iron and Wagon, Carriage and Cutter Hardware. He has the exclusive sale of all their products.

F. W. Danforth, representing the Francis Axe Company, Buffalo, N. Y., has started on a business trip, and will visit the trade in Wisconsin and Minnesota.

In alluding to their recent purchase of the stock of the Bridgeport Table Cutlery Company, the Simmons Hardware Company, St. Louis, Mo., announce that, having bought the goods cheap, they will sell them cheap, so as to work them off as quickly as possible. The extent of this purchase is indicated in the statement of the company that it consists of four carloads of Table Cutlery, Butcher Knives, Carving Knives, &c., so that they allude to it as probably the largest single purchase of Table Cutlery ever made in America.

Geo. K. Oyler, successor to the George K. Oyler Mfg. Company, St. Louis, Mo., issues a catalogue of his line of Colters, the different patterns of which are illustrated. A separate sheet, giving prices on Rolling Colters, Colter Blades and Hubs, is also issued.

E. C. Meacham Arms Company, St. Louis, Mo., under date February 10, issue their No. 375 price current. It represents

a large line of Guns, Ammunition, Gun Goods and Sporting specialties, of which quotations are given in the company's usual manner.

The annual meeting of the Stanley Works was held at New Britain on the 11th inst., when the following officers were elected: William H. Hart, president and treasurer, Peter McCartee, vice-president, and L. N. Pease, secretary.

W. A. Ross & Bro., 56 Pine street, New York, issue a circular calling attention to their Patent Eye Sash Weights, in which their sales in 1887 are announced as amounting to 3188 tons, and some of the advantages of their weights pointed out. Reference is also made to their facilities for manufacturing and shipping Sash Weights. They also make Dumb Bells, Loom and Horse Weights, and other cheap iron castings, as well as Lead Sash Weights.

Charles W. Packer, Philadelphia, issues circulars relating to his Standard, Expert and Model Ice-Cream Freezers, of which cuts are given, with reference to some of the special features of the machine. They call special attention to their new Freezer, the Expert, which is stated to be intended for use where economy of ice is an object. The list price is the same as on the Standard Freezers, but a greater discount is given.

Owing to the increased demand for the Roberts' Adjustable Fly Screen, for which they are agents, Edward Darby & Sons, Philadelphia, advise us that to their present territory of Pennsylvania have been added the States of Maryland, New Jersey and Delaware.

The catalogue of the Meriden Cutlery Company, Meriden, Conn., and 97 Chambers street, New York, is elegantly printed, with cuts and paper of exceptional excellence. The reduced size of the cuts renders the pamphlet of convenient size for preservation and reference.

The firm of Kenny & Stewart, Blair, Neb., after many years of prosperous business, have been dissolved. Mr. Kenny will devote his efforts and capital to the banking business, a field for which he is referred to as well adapted, by reason of his experience, extensive acquaintance and the confidence reposed in him. The new firm of J. H. Stewart & Co. have been organized, and are reported to be carrying on the business in an extensive establishment.

The Fred. J. Meyers Mfg. Company, Covington, Ky., have issued a pretty colored lithograph, representing the use of their Hunter Sifter.

Among the "Special Notices" on page 49 is one in which the advertiser, who is to be addressed P. O. Box 3226, New York, announces that he would like to correspond with reliable parties who are able to undertake the manufacture, outside of the United States, of Latches, Store Door Locks, and fine goods of this description. We are also advised by him that several inquiries in reply to a similar advertisement that appeared in our issue of January 5 were by mistake returned to the writers. If these parties will address as above again, their letters, we are assured, will have the best attention at once.

SARGENT & CO.,

New Haven, Conn., and New York, in their discount sheet, the first part of which, containing prices on goods of their own manufacture, was published last week, quote the following prices on the line of General Hardware which they are handling. The discounts given below are subject to an additional discount of 10 per cent. for prompt cash. Cases in which there has

been a change in the list are indicated by an asterisk (*):

Warner's Parlor Door Hangers.....	20	Large Head Carpet Tacks.....	4' & 10'	Molding Planes.....	33 1/2
Stearns's Parlor Door Hangers.....	30	Tinned Large Head Tacks.....	7 1/2' & 10'	Grooving Plows.....	33 1/2
Stearns's Barn Door Hangers.....	45	Gimp and Lace Tacks, Plain and Tinned.....	6 1/2' & 10'	Chapin's Gauges.....	60
Victor Barn Door Hangers.....	40 & 7 1/2	Looking Glass Tacks.....	45 & 10	Scholl's Gauges.....	60
Victor Hanger Rail, 7 cts. per ft.....	40 & 7 1/2	Large Head Minors Tacks.....	6 1/2' & 10'	No. 2 Try Squares.....	60
Plate Locks and Keys.....	25 & 2	Cigar Box Nails.....	45 & 0	Stanley's Improved Try Squares.....	30
Deitz Store Door Locks.....	25 & 2	Chair Nails.....	60 & 10	Stanley's Adjustable Try Squares.....	30
Yale Rim Head Locks.....	2 & 7 1/2	Finishing Nails.....	60 & 10	Winterbottom's Try Squares.....	30
Yale Night Latches.....	30 & 7 1/2	Common Brads.....	60 & 10	No. 2 T Bevels.....	60
Langstroth's Locks and Latches:		Trunk and Gout Nails.....	60 & 10	Stanley's Bevels.....	60
Flat Key.....	39 1/2	Round Head Hungarian Nails.....	60 & 10	Pocket Levels.....	70
Round Key.....	40	Hob Nails.....	67 1/2 & 10	Level Glasses.....	70
Blanks and Keys.....	25	Zinc Glaziers' Points.....	45	Plumbs and Levels.....	70
Scandinavian Padlocks:		Japanned Lining Nails.....	45	Davis's Levels, Nos. 1 to 4.....	11
Loose Shackle.....	85 & 30	Silvered Lining Nails.....	45	Davis's Levels, Nos. 5 to 9.....	20
Fast Shackle.....	85 & 30	Japanned Saddle Nails.....	30	Davis's Bench Levels, Nos. 10, 11, 12.....	20
Horse Shoe Padlocks.....	25	Silvered Saddle Nails.....	40	Davis's Pocket Levels.....	11
Brown's Patent Padlocks.....	20	Furniture Nails.....	30	Boxwood Rules.....	80
Eagle Padlocks, Nos. 4010 to 4012.....	16 1/2 & 2	China Nails and Disks.....	40 & 7 1/2	Ivory Rules.....	50
Eagle Padlocks, Nos. 4017 to 4020.....	33 1/2 & 2	Steel Wire Brads and Nails.....	60 & 2	Miscellaneous Rules.....	65
Eagle Padlocks, Nos. 4022 to 4024.....	16 1/2 & 2	Iron Escutcheon Pins.....	60	Spring Pocket Tapes.....	39 1/2
Eagle Padlocks, Nos. 4027 to 4034.....	16 1/2 & 2	Brass Escutcheon Pins.....	60	Measuring Tapes:	
Yale Padlocks.....	30 & 7 1/2	Stocks and Dies.....	25	Nos. 30 to 37, Cotton Tape.....	20
Deitz Padlocks.....	33 1/2	Plug and Taper Taps.....	40 & 7 1/2	All other numbers.....	20
Deitz Drawer and Cupboard Locks:		Nicholson Files.....	50 & 11	Measuring Tapes.....	20
Nos. 36 to 39.....	39 1/2	Nicholson Horse Rasps.....	50 & 11	Steel Tapes.....	20
Nos. 51 to 63.....	40	Heller's Horse Rasps.....	50	S. & Co.'s U. S. Augers and Bits:	
Nos. 86 to 96.....	24 1/2	"Always Ready" Wrenches.....	16 1/2	No. 33, Augers, 2 1/2 inch and under.....	55
Yale "Standard" Locks.....	20 & 7 1/2	No. 77, Coes' Pattern Wrenches.....	75 & 11	No. 33, Augers, 2 1/2 and 3 inches.....	50
Tucker's Alarm Tills.....	40	No. 33, Coes' Pattern Wrenches.....	70	No. 44, Boring Machine Augers.....	60
Defiance Alarm Tills, \$36.....	40	Coes' Genuine Wrenches.....	0 & 5	No. 55, Auger Bits.....	55
Eagle Pin-Tumbler Locks.....	16 1/2 & 2	Boardman's Wrenches.....	20	No. 59, Car Bits.....	40
Eagle Locks.....	20, 7 1/2 & 2	Donohue's Engineers' Wrenches.....	20	No. 88, Auger Bits.....	35
Router Bit and Carriage.....	Add 11	"Model" Pipe Cutters.....	50	No. 155, Auger Bits.....	16 1/2
"Duer" and "Paragon" Locks.....	20, 7 1/2 & 2	S. & Co.'s Hammers.....	39 1/2	No. 188, Auger Bits.....	16 1/2
Eagle Pin-Tumbler Chest Locks.....	16 1/2 & 2	Maydole's Hammers.....	16 1/2	N. H. Edge Tool Co.'s Augers and Bits:	
Eagle Locks, No. 679 only.....	16 1/2 & 2	No. 20, Adze Eye Nail Hammers.....	50	No. 20, Augers.....	60 & 5
Eagle Keys and Blanks.....	20, 7 1/2 & 2	Steel Face Shoe Hammers.....	33 1/2	No. 30, Augers, 2 1/2 inch and under.....	60
Assorted Keys.....	20, 7 1/2 & 2	Underhill Hatchets.....	20	No. 30, Augers, 2 1/2 and 3 inches.....	50 & 11
Escutcheons for Eagle Locks.....	20, 7 1/2 & 2	Ladd's Hatchets.....	55	Cuban Augers.....	50
Wrought Brass Butts.....	70	"Champion" Shingling Hatchets.....	70	No. 25, Auger Bits.....	60 & 5
Light Narrow Wrought Butts.....	65	Sargent & Co.'s Hatchets, &c.....	40	No. 50, Auger Bits.....	60
Narrow Wrought Butts.....	65	S. & Co.'s Bench Axes.....	40	No. 80, Auger Bits.....	70
Broad Wrought Butts, Fast Joint.....	65	S. & Co.'s Adzes.....	35	Russell Jennings's Augers and Bits.....	16 1/2
Broad Wrought Butts, Loose Joint.....	65	Sargent & Co.'s Broad Axes.....	35	Cast Steel Augers, to 2 1/2 inches only.....	60
Light Narrow Loose Pin Butts.....	65	Douglas Axe Co.'s Hunt Goods.....	40	Cast Steel Augers, 3 inches and larger.....	50
Light Loose Pin Wrought Butts.....	65	Broad Hatchets.....	40	Boring Machine Augers.....	60
Light Inside Blind Loose Pin Butts.....	65	Broad Axes, all patterns: Ship Broad Axes.....	33 1/2	Cast Steel Auger Bits.....	60
Wrought Butts.....	65	Axes.....	33 1/2	Add Cook's C. S. Auger Bits. Use the list of	
Bronzed Wrought Butts.....	40	Picks, 2 to 7 pounds.....	30	Circular Lip Bits.....	50
American Spring Hinges, Japanned.....	11	Mattocks, all.....	33 1/2	Car Bits.....	50
All excepting Japanned.....	Add 11	Grub Hoes.....	33 1/2	"Model" Expansive Bits.....	33 1/2
Gem Spring Hinges, Japanned.....	11	Sargent & Co.'s Mattocks and Picks.....	55	Steer's Patent Extension Bits.....	25
All excepting Japanned.....	Add 11	N. H. Edge Tool Co.'s Bush Hoes.....	25	L. Hommedieu's Ship Augers and Bits.....	6
Domestic Blind Adjusters.....	25	Reatty's Bush Hoes.....	25	Add Watson's Ship Augers and Bits, same list	
Van Sand's Blind Fasteners, No. 2030.....	60	Lee's Post Hole Augers.....	25	as L. Hommedieu's.....	15
Van Sand's Blind Fasteners, No. 3705.....	50	Extra Blades for Lee's Augers.....	33 1/2	Enterprise Tap Bore.....	20
Huffer's Blind Hinges.....	40 & 7 1/2	Disston's Post Hole Diggers.....	16 1/2	Ives's Tap Bore.....	20
Wollensak's Trassom Cutters:		Disston's Saw Mandrels.....	14 1/2	Clark's Tap Bore, make void, 2 1/2, 2 1/2 & 3 inch.....	30
Bronzed Iron and Nickel.....	40 & 7 1/2	Conqueror Swage, &c.....	16 1/2	Bouney's Spoke Trimmers.....	33 1/2
Bronzed Metal.....	15	Disston's Solid Tooth Circulars.....	40	Stearns's Spoke Pointers.....	20
Warner's Door Springs.....	40	Disston's Inserted Tooth Circulars.....	40	Ives's Spoke Trimmers.....	25
Wrought Brass Rail.....	Net	Disston's Gang Saws.....	40	Ives's Hollow Augers.....	25
Pump and Well Chain.....	10	Disston's Cross-Cut Saws.....	45	Ives's Expansive Hollow Augers.....	40
Jack Chain:		Triumph Narrow Cross-Cut.....	45	Bouney's Hollow Augers, No. 4.....	40 & 7 1/2
IRON.....	70	One-Man Cross-Cut.....	40	Sargent's Hollow Augers, No. 50.....	20
Brass.....	65	Cross-Cut Saw Handles.....	40	Stearns's Hollow Augers, No. 0, 1 and 3.....	20
Brass Safety.....	65	Disston's Panel, Hand and Rip Saws.....	16 1/2	Metal Head Gimlets.....	50
German Coil Chain.....	55	Disston's special Hand Saws.....	16 1/2	Ives's D. C. Gimlets.....	45
German Cow Ties.....	25	Back Saws.....	16 1/2	Laod's D. C. Gimlets.....	55
German Hauger Chains.....	75	Key Hole Saws.....	16 1/2	No. 95, U. S. Gimlets.....	25
Porter's Screen Corners, &c.....	33 1/2	Compass Saws.....	16 1/2	Jenning's "Star" Gimlets.....	45
Wickwire Window Screen Cloth:		Interchangeable Compass Saws.....	16 1/2	U. S. Gimlet Bits.....	25
Plain Colors, \$2 15 per 100 square feet.....	Net	Nest of Saws.....	16 1/2	Ladd's D. C. Gimlet Bits.....	60 & 5
Braided Wire Picture Cord, per dozen coils.....	65	Disston's Saws.....	16 1/2	Shepardson's D. C. Gimlet Bits.....	40
Wax Flower Wire.....	55 & 5	Disston's Pruning Saws.....	16 1/2	Shepardson's Pod Bits.....	40
Wire Clothes Lines.....	45	Griffin's Hack Saws, complete.....	40	Countersinks, Nos. 6, 8, 9, 16.....	30
Wire on Spools.....	60	Griffin's Blades only.....	40	Shepardson's Countersinks.....	40
Iron Screws, list of July 1, 1887:		"Star" Hack Saws.....	16 1/2	No. 10, Square Reamers.....	30
Flat Head, Bright, all sizes.....	60 & 2 1/2	"Star" Bracket Saw Blades.....	30	Wheel r's Countersinks.....	30
Round Head, Iron Screws, either Bright or		Chapin's Turning Saws and Frames.....	30	Ives's Countersinks.....	20
Blue.....	60 & 2 1/2	Disston's Saw Webs.....	16 1/2	Shepardson's Countersink Bits.....	40
Flat Head, Japanned and Coppered.....	50 & 11	Disston's Billet.....	16 1/2	Ives's Screw Driver Bits.....	45
Round Head, Japanned and Coppered.....	50 & 11	Wood Saw Frames.....	30	Ladd's Screw Driver Bits.....	45
Flat Head, Berlin, Bronzed.....	60 & 2 1/2	Disston's Framed Wood Saws.....	16 1/2	Extension Bit Holders.....	40
Round Head, Berlin, Bronzed.....	55	Tang Firmer Chisels and Gouges.....	40	"Novelty" Drill Chucks.....	Net
Brass Screws:		Carpenters' Sicks, N. H. E. T. Co.'s.....	70 & 7 1/2	"Champion" Screw Drivers.....	20 & 10
Flat Head, Brass and Bronze.....	60 & 2 1/2	No. 1, Corner Chisels, N. H. E. T. Co.'s.....	70 & 7 1/2	Eldrich Hatchet Screw Drivers.....	20 & 10
Round Head, Brass and Bronze.....	50 & 11	No. 5, Millwrights' Chisels, N. H. E. T. Co.'s.....	70 & 7 1/2	Boring Machines, no Augers No. 20, \$5.50; No.	
Machine Screws:		No. 1, Framing Chisels, N. H. E. T. Co.'s.....	70 & 7 1/2	20, \$3.20.....	50
Flat Head, Iron.....	50	No. 2, Framing Chisels, N. H. E. T. Co.'s.....	70 & 7 1/2	Boring Machines with Augers.....	50
Round Head, Iron.....	40 & 7 1/2	No. 3, Framing Chisels, N. H. E. T. Co.'s.....	70 & 7 1/2	Auger Handles.....	30
Fillister Head.....	40 & 7 1/2	No. 10, Firmer Chisels, N. H. E. T. Co.'s.....	70 & 7 1/2	Ives's Patent Auger Handles.....	25
Grill ey's Capped Screws.....	39 1/2	No. 41 Socket Firmer Chisels.....	16 1/2	Ball Braces.....	60
Nickel-Plated Iron Screws:		No. 20, Firmer Chisels, N. H. E. T. Co.'s.....	70 & 7 1/2	Barber's Braces.....	40 & 7 1/2
Flat Head.....	70 & 7 1/2	No. 15, Paring Chisels, N. H. E. T. Co.'s.....	16 1/2	Barb-r's Ratchet Braces, Nos. 30-33.....	40 & 7 1/2
Round Head.....	60 & 7 1/2	No. 40, Mill Chisels, N. H. E. T. Co.'s.....	16 1/2	Drill Braces.....	16 1/2
Nickel Plated Brass Screws:		No. 25, Gouges, N. H. E. T. Co.'s.....	16 1/2	Millers Falls Hand Drills.....	16 1/2
Flat Head.....	65	No. 30, Gouges, N. H. E. T. Co.'s.....	16 1/2	Millers Falls Breast Drills.....	16 1/2
Round Head.....	60 & 7 1/2	No. 35, Mill Gouges, N. H. E. T. Co.'s.....	16 1/2	Breast Drills, Nos. 1, 2, 3.....	40 & 10
Silvered Iron Screws:		Adjustable Handle Drawing Knives.....	11	Patent Breast Drills, No. 22.....	30
Flat and Round Head, not Burnished.....	50	Wilkinson's Folding Drawing Knives.....	16 1/2	Stanley's Box Scrapers, No. 70.....	30
Flat and Round Head, Burnished.....	40 & 7 1/2	No. 1, Draw Knives, N. H. E. T. Co.'s.....	70 & 7 1/2	Box Scrapers, Nos. 1, 2, 11, 12.....	45
Side Knob Screws:		No. 2, Draw Knives, N. H. E. T. Co.'s.....	70 & 7 1/2	Iron Spokeshaves, Nos. 11, 12, 13.....	40
Blue, 44 cents per gross.....	60 & 2 1/2	No. 3, Draw Knives, N. H. E. T. Co.'s.....	60	Stearns's Spokeshaves.....	22 1/2
Red Screws.....	11	No. 5, Draw Knives, N. H. E. T. Co.'s.....	70 & 7 1/2	Stanley's Chamfer Spokeshaves.....	30
Coach Screws, all sizes.....	60 & 7 1/2	N. H. E. T. Co.'s Drawing Knives.....	70 & 7 1/2	Wood Spokeshaves.....	22 1/2
Common Carriage Bolts.....	70	N. H. E. T. Co.'s Plane Irons.....	20	Trammel Points.....	30
Phila. Pattern Carriage Bolts.....	80	Bailey's Adjustable Planes:		No. 40, Compasses.....	65
Eagle Phila. Carriage Bolts.....	60 & 2 1/2	Nos. 1 to 34.....	30	No. 50, Dividers.....	60
Common Tire Bolts.....	65	Stanley Adjustable Planes:		No. 60, Calipers.....	60
Add Elm City Tire Bolts, same list as Com-		Nos. 104 to 132.....	30	Calipers, Nos. 62, 63, 65.....	60
mon.....	60 & 7 1/2	Stanley Combination Planes.....	20	Self-Registering Calipers.....	33 1/2
Add May State Tire Bolts, same list as Com-		Stanley Iron Block Planes.....	30	No. 30, Lever Saw Set.....	45
mon.....	65	"Victor" Iron Planes.....	20	Stillman's Saw Sets.....	45
Eagle Phil. Tire Bolts.....	75 & 11	Steer's Patent Iron Planes.....	30	Leach's Saw Sets.....	6
Philadelphia Tire Bolts.....	80 & 2 1/2	Plane Handles.....	40	Morrill's "Perfect" Saw Sets.....	40
Norway Tire Bolts.....	75	Saw Handles.....	40	Croissant's Keller Saw Sets.....	33 1/2
Am. Screw Co.'s Stove Bolts.....	55, 5 & 2 1/2	Common Planes.....	40 & 7 1/2	Disston's "Star" Saw Sets.....	20
Plow Bolts.....	50	Extra Bench Planes.....	33 1/2	No. 15, Hammer Saw Sets.....	Neer
Black and Tinned Rivets.....	40 & 7 1/2	Premium Bench Planes.....	33 1/2	Stanley's Miter Boxes.....	20
Iron Rivets in bulk.....	40 & 7 1/2	Planes with English Irons.....	20 & 10	No. 10, Bench Hooks.....	Net
Tinned Rivets and Burs.....	40 & 7 1/2	Planes Nos. 411 to 422.....	20 & 10	Morrill's "Perfect" Bench Stops.....	40
Copper Rivets and Burs.....	40	Sets of Planes in Cases.....	33 1/2	Socket Scratch Awns.....	25
American Iron Cut Tacks.....	70 & 10	Ship Planes.....	33 1/2	Chalk Line Reels and Awns.....	30
Quarter Wt. Cut Tacks, As't boxes.....	70 & 10	Tuy Planes.....	33 1/2	Cigar Box Openers.....	50
Swedes Cut Tacks and Upholsterers.....	67 1/2 & 10	Coop-ra' Planes.....	33 1/2	Pliers, all numbers.....	11
Copper Tacks.....	40	Miscellaneous Planes.....	34 1/2	Cast Steel Pliers, Nos. 11, 12.....	45

Gas Pliers.....	55	Platform Scales *.....	60	"Geneva" Hand Fluters.....	108 1/2
Rivet Sets.....	45	Fluting Machines: Crown.....	20&10	"Dover" Egg Beaters.....	40&7 1/2
Solid Punches.....	45	Original Knox Fluters *.....	20&10	"Triumph" Egg Beaters.....	15
Saddlers' Punches *.....	55	American.....	20&10	"Acme" Fry Pans.....	20
Spring punches.....	50	Eagle Fluting Machines.....	20&10	Meat Cutters.....	25
Peg Breaks, Nos. 11 to 20.....	40&10	Crown Hand Fluters.....	20&10	Edgar's Shovels.....	50&5
Peg Breaks, No. 50.....	33 1/2	A. M. Co.'s Clothes Wringers.....	25	Chatillon's Balances, Round and Straight, to	
Bonney's Washer Cutters.....	33 1/2	Fluting Scissors.....	40	No. 71 inclusive.....	40&7 1/2
King & Smith Washer Cutters.....	2&10	Pinking Irons.....	50&5	Chatillon's Circular Balances.....	50&11
No. 10 Washer Cutters.....	40	Enterprise Sad Irons.....	40	Chatillon's Ice Balances.....	50&11
Ames' shoe Knives.....	6	Mah. ny's Sad Irons:		Steeleyards.....	40
Ames' Cigar Knives.....	6	"smooth Face and Rough.....	10		
Ames' Bread and Kitchen Knives.....	6	Troy Polishing.....	10 1/2		
Wostenholme's Farrier Knives.....	Net	Self-Heating Sad Irons.....	11		
Heel Stuffers.....	3 1/2	"Excelsior" Tailors' Irons.....	Net		
"Rival" Ice Creepers.....	25	Ice Cream Freezers:			
Bonney's Vises.....	40	"American" and "tar".....	55		
Bonney's Saw Vises *.....	40	"Gem".....	60		
Stearns' Saw Vises.....	3 1/2	"Crown" single and double.....	55		
Stearns' Screw Clamps *.....	10	"Crown" Ice Chippers.....	33 1/2		
Hammer's Adjustable Clamps.....	11	Tinned Iron Spoons.....	7 1/2		
Hammer's Plain Clamps.....	33 1/2	Basting Spoons.....	65		
Hammer's Adjustable Clamps.....	9	Britannia Spoons.....	50		
Hickory Hand Screws.....	30	"Excelsior" spoons and Forks.....	25		
Wood bench Screws.....	45	Plated Steel Spoons and Forks.....	33 1/2		
Lothrop's Trowels.....	10 1/2	Nickel Silver Spoons and Forks.....	45		
Bisson's Trowels.....	16 1/2	Holmes & Edwards' Plated Ware.....	55		
Sheet Metal Screw Drivers:		Tin Case Thermometers.....	75&11		
Zinc.....	60	Dairy Thermometers.....	75&11		
Zinc, Brass Bottom.....	60	Fancy Thermometers.....	60		
Brass and Copper.....	45	Thermometer and Barometer.....	60		
Tin Oilers.....	60	Torrey's Razor Stroops *.....	Net		
Paragon Oilers, Zinc.....	60	Torrey Razors.....	11		
Paragon Oilers, Brass.....	45	Glass Curtain Pins.....	add 10		
Sewing Machine Oilers:		Brass Curtain Rings.....	60		
Nos. 00 to 711.....	60	Brass Screw Rings.....	60		
Mowing Machine Oilers:		Rack Pulleys, No. 100.....	40		
No. 473, in boxes.....	50	Rack Pulleys, Nos. 1, 4, 5.....	33 1/2		
No. 473, in bulk.....	55	Rack Pulleys, Nos. 150 and 160.....	33 1/2		
No. 67, in bulk only.....	45	Bullard's Carpet Stretchers.....	30		
Olmstead's Oilers, Tin and Zinc.....	50	Black Walnut Stair Rods.....	50&5		
Olmstead's Oilers, Brass.....	40	Brass Stair Rods and Fastenings.....	10		
Hammer's Oilers:		Polished Fire Irons.....	45&2		
Old Style as in Catalogue.....	30	Shovel and Tongs.....	60		
Extra Tubes.....	30	"Delusion" Mouse Traps.....	15&10		
Lamps.....	15	Wood Mouse Traps.....	65		
Washita Oil Stone.....	20	Lane's Carriage Jacks.....	11		
Washita Oil Sticks.....	20	Nubian Metal Polish.....	25		
Arkansas Stone.....	Net	Brass Lever Hubs.....	50		
Mounted Washita Stone.....	40&7 1/2	Kerosene Lamps.....	40		
Mounted Arkansas Stone.....	40	Bottling Cocks.....	40		
Hindustan Stone.....	50	Liquor Taps.....	40		
Sand Stone, 5 cents per pound.....	50	Compression Lock Cocks *.....	40		
Pike's Sycamore Stone.....	33 1/2	Racking Cocks.....	40		
Glue Pots.....	30	Globe Cocks *.....	40		
"Handy" Glue Pots.....	40&7 1/2	Beer Cocks *.....	50		
Chalk and Crayon.....	Net	"Acme" Measuring Faucets.....	25		
Concentrated Borax.....	Net	Enterprise Measuring Faucets.....	20		
Blacksmith's Bellows.....	40&7 1/2	Lane's Measuring Faucets.....	25		
Dixon's Stove Polish.....	10	Petroleum Faucets.....	33 1/2&5		
Sand and Emery Paper and Cloth.....	11	Star Faucets.....	55		
Cotton Chalk and Fish Lines.....	50	Cork Lined Faucets.....	66 1/2		
Linen Fish Lines.....	25	Sommer's Cork Lined Faucets:			
Hawser Laid Fish Lines.....	25	Regular Size.....	40		
Mason's Linen Lines.....	25	Extra Large.....	15		
Mason's Colored Cotton Lines.....	40	Sommer's Tin Key Faucets.....	33 1/2		
Cotton Trot Lines.....	25	Metallic Key Faucets.....	55		
Silver Lake Sash Cord:		Giant Nail Pullers.....	Net		
A Quality, Cotton and Hemp.....	10	Handcuffs, &c. *.....	10 1/2		
B Quality, White and Drab.....	30	Phillips' Nippers *.....	10 1/2		
C Quality, White Cotton only.....	30	Ulster Sleds.....	40		
Silver Lake Chalk Lines.....	10 1/2	Revolvers.....	40		
Silver Lake Awning Lines.....	25	Rim Fire Cartridges.....	45		
Silver Lake Clothes Lines.....	Net	Blacks, excepting Nos. 22 and 32.....	45&10		
Silver Lake Rope.....	10	Blacks, No. 22, \$1.95.....	Net		
"O. K." Braided Sash Cord.....	30	Blacks, No. 32, \$3.95.....	Net		
Roebing's Wire Sash Cord.....	4	Center Fire Cartridges.....	10 1/2		
Carpenter's Pencils *.....	35	Call Bells, White Finish.....	33 1/2		
Dixon's Lumber Pencils.....	25	Call Bells, Silver Plated *.....	25		
Dixon's Pencils.....	15	Call Bells, Nos. 353 and 385.....	25		
Dixon's Graphite Pencils.....	10	Call Bells, Nos. 703 to 758.....	25		
"V. B. M." Shears and Scissors:		Call Bells, Nos. 71 to 80.....	33 1/2		
Japanned.....	60&5	Hand Bells:			
Nickel Plated.....	50	Fine Polish.....	60&10		
Ladd's Straight Trimmers:		White Metal.....	60&10		
No. 20 Japanned.....	80&10	Ladd's Fine Polish.....	60 1/2		
No. 30, Nickel Plated.....	70&7 1/2	Pure Bell Metal.....	50		
Wiss' Tailors' Shears.....	40	Milkmen's Bells.....	10 1/2		
Horse Clipping Machines.....	25	Silver Chime Hand Bells.....	25		
Henry's Pruning Shears, Nos. 1, 2.....	50	Globe Hand Bells.....	25		
Sargent's Pruning Shears, Nos. 50, 51, 52.....	55	White Metal Tea Bells.....	35		
"Victor" Pruners, No. 20.....	50	Extra Fine Tea Bells.....	25		
Tree Pruners.....	45	Single Stroke Trip Gongs.....	16 1/2		
Wilkinson's Hedge Shears.....	25	Gong Door Bells:			
Grass Hooks.....	50	Abbe's Patent.....	25		
Excelsior Mowers:		"Yankee".....	40		
Roller Mowers.....	33 1/2&5	Abbe's Extra Large.....	16 1/2		
Side-Wheel Mowers.....	50	Alarm Door Bells:			
New Model, same list as Side Wheel.....	50	Abbe's Patent.....	25		
Horse Mowers.....	33 1/2&5	"Yankee".....	40		
Corn Knives.....	50	House Bells.....	40		
Saw Knives.....	30	Strapped Team Bell's.....	40		
Hay Knives (not patent).....	30	Patent Fastening Team Bell's.....	40		
Heath Patent Hay Knives.....	Net	Horse Car Bells.....	40		
Lightning Hay Knives.....	10&10	Cotton Cards.....	10, 10&5		
Parker's Coffee Mills.....	45	Wool, Tow and Mixing Cards.....	10&10		
Enterprise Coffee Mills.....	20	Worse Cards.....	10		
Swift Coffee Mills.....	20	Curry Combs.....	55		
Coffee Roasters.....	20&5 1/2	"Perfect" Curry Combs *.....	40&7 1/2		
Saw and Croot Cutters.....	10 1/2	Rubber Curry Combs.....	30		
Cleavers and Choppers:		Malleable Cock Eyes *.....	40		
N. H. Edge Tool Co.'s.....	33 1/2	Judd's Harness Snaps.....	60&5		
Beatty's.....	50	Blake's Belt Studs, Improved.....	33 1/2		
Mining Knives.....	33 1/2	Blake's Belt Studs, old style.....	45		
Smith's Patent Mining Knife.....	40	Cutters and Awls.....	25		
Seakreigh's.....	10 1/2	Baxter's S Wrenches.....	40		
Burnished Fry Pans.....	10 1/2	Baxter's Diagonal.....	40		
Nicholson's Steels.....	15	Nash's Saw Sets.....	20		
"Little Giant" Lemon Squeezers.....	11	Wentworth's Saw Vises.....	20		
"Star" Lemon Squeezers.....	4&7 1/2	Lowell Hand Vises.....	11		
"American" Ice Chisels.....	60&10	Hall's Nippers and Pliers *.....	20		
No. 4, Sardine Knives.....	55	Spofford's Braces.....	50		
No. 6, Sardine Scissors.....	55	Reid's "Lightning" Braces.....	20		
"Star" Can Openers.....	55	Gay's Hatch T Screw Drivers.....	20&10		
Enterprise Meat Choppers *.....	1 1/2	Clark's Screw Drivers.....	25		
Enterprise Beef Shavers.....	10 1/2	Clark's Expansive Bits.....	10 1/2		
Enterprise Cherry Stoners, \$5 list.....	20	"Bee" Gimlet.....	50		
Enterprise Fruit Presses.....	20	Morse's Twist Drills.....	50		
Turnbull's Market Scales.....	10	Penny's Washer Cutters.....	52		
Grocers' Scales.....	50	Bracket Saws.....	10 1/2		
Hatch's Tea and Counter scales.....	50	Crossman's Drawing Knives.....	60&7 1/2		
		Crossman's Chisels.....	60&7 1/2		
		Richard's Improved Door Hangers.....	30		

New Box Strap.

H. S. Brewington & Co., Baltimore, Md., are about putting on the market an improved strap for securing packages, the invention of their H. S. Brewington. In this device coiled staples are used, such staples being coiled around the strap at convenient intervals, and then driven into the wood, thus giving, it is claimed, a special security. These staples are made for use on either wire or hoop iron. It is intimated that these straps and staples will not cost more than the ordinary hoops. The staples are furnished on the wire, but can be moved when they happen to come where the boards join, by a blow of the hammer. The strength of this fastening, the facility with which it is applied and the moderate cost are points emphasized by the manufacturers.

Recent Legal Decisions.

TRADE-MARK.

D., a dairyman, made butter in 1810 for market and stamped it with a cornucopia and his name, J. Darlington; he relinquished the business to his son, Jared, in 1832, and he continued the use of the device and the same stamp, having the same initials, and in 1862 Jared was succeeded by his three sons and the widow of a fourth son, who agreed among themselves to use the cornucopia, and each his and her individual name. This butter has always been known as "Darlington Butter," brings a high price, and has a ready sale. P., a dairyman, living in the same vicinity as the Darlingtons, began to make butter for market in 1873, using his father's former stamp "Pratt," and the words "Cumberland Dairy, 333," but after the death of Jared Darlington he changed his print to a cornucopia and stamped his name upon the butter. The Darlingtons, who made over 2000 pounds of butter a week, claiming that Pratt was simulating their stamps, which were their trade-mark, sued for an injunction and got it. In this case—Pratt's appeal—the Supreme Court of Pennsylvania affirmed the decree for an injunction. Judge Paxson, in the opinion, said: "If the defendant's print is an imitation of that of the plaintiffs, if it is calculated to deceive and mislead, the motive in adopting it is not material so far as the law of the case is concerned, however much it might affect it in a moral point of view. The protection which equity extends in such cases is for the benefit of the manufacturer, and to secure to him the benefit of his reputation, skill and industry. The protection of the public is another consideration, and one that does not usually enter into such cases. A man may be adjudged a wrong-doer and yet have no intention or thought of fraud, as where two traders take the same symbol, each in ignorance that the other uses it, or with an honest doubt as to who has the legal right therein. The question, therefore, is whether the defendant's label or mark is calculated to deceive the public, and to lead it to suppose it is purchasing an article manufactured by the complainants instead of the defendant. The Master in Chancery finds, as a fact, that defendant's print is calculated to mislead the public. In this we cannot say that he committed an error. It is true the two prints, when placed side by side, present several points of dissimilarity, and the fact that defendant's butter is stamped with his own name was pressed as a reason why there was no danger of deception, and defendant denies any intention to deceive. But why did he abandon his father's print, or trade-mark, which he, himself, had used for years, and adopted the symbol which had been in use by the Darlington family for over 70 years? The mere name of a person, or of a place, cannot, as a general rule, be appropriated as a trade-mark; at least, not in the sense of preventing another person having the same name, and residing in the same place, from using it. The agreement between the Darlingtons of to-day, to make each the "Darlington Butter," stamping it with the cornucopia, each putting his own name on it, is not, in any way, as claimed, a fraud on the public. The business is continued by the same family, with the same name, at the same place, and

with the same skill. Under these circumstances their trade-mark cannot be interfered with by a stranger who has never acquired a right to use it."

DISCHARGE OF CLERK.

K. employed F. for one year at wages amounting to \$1800 a year, payable \$37.50 weekly, and five months later he discharged him, as he closed up his business, which was dealing in essential oils and essences. F. reported daily for duty, but refused employment offered to him by K. in making and selling fancy boxes. F. earned only \$15 in seeking other work, and the jury gave him a verdict of \$712. The case—Fuchs vs. Koerner—was carried to the Court of Appeals of New York, where the judgment was affirmed. Judge Danforth, in the opinion, said: "The defendant rests his appeal upon the contention that the plaintiff was bound to seek and to show that he had sought other employment in order to relieve him from any unnecessary demand. The charge to the jury below, that it was the plaintiff's duty to use reasonable diligence in procuring another place of the same kind, in order to relieve the defendant, as much as possible, from the loss consequent upon his breach of contract, but that he was not bound to accept occupation of another kind, was a declaration of the proper rule of law. He, plaintiff, was ready during the entire year to perform his agreement, and could not be required to enter upon a new business, or one different from that he had undertaken."

BANKING—FORGED CHECKS.

A. W. on going away in 1885 for eight months left his business in his brother's charge. On his return he found that his bank had paid and charged to his account forged checks to the amount of \$1,082.05. Two months before A. W.'s return his bank book was balanced and delivered to his brother, who failed to make any examination of the books and the returned checks. A. W. demanded that the bank pay him the amount of the forgeries, but it refused, and he brought an action to recover the amount, and the bank set up that it was too late to bring the action, as the bank had not had early notice of the forgeries after the bank book had been settled and delivered to plaintiff's agent. In this case—Weinstein vs. National Bank of Jefferson—the plaintiff was defeated, and on an appeal to the Supreme Court of Texas the judgment was affirmed. Judge Gaines, in the opinion, said: "When a banker delivers a settled bank book to the depositor he impliedly says: 'This is my account; examine it, and if not found correct report to me its inaccuracies,' and if the depositor fails to complain within a reasonable time the banker has the right to consider that there was no objection to the account. It is the duty of the depositor to know whether the amount is correct or not, and promptly to report a forgery when detected. If he fails to make the examination and discovery of a forgery he expressly admits that the checks are genuine, and he will not be permitted to deny the fact if the bank is prejudiced by his failure."

Messrs. O. W. Potter, W. L. Potter and John C. Parkes, of the North Chicago Rolling Mill Company, with a party of friends, left Chicago on the 13th inst. in a special car to take a pleasure trip to the City of Mexico, Vera Cruz, and other points of interest in the territory of our Southern neighbor. On their way home they may visit the iron regions of Alabama and Tennessee. They expect to be absent three weeks.

American purchasers of steel rails, as well as American steel rail manufacturers, will be interested in the important news published by a Western contemporary, which announces in a recent issue that "China now has a complete Bessemer steel rail plant nearly ready to begin operations, and is now prepared to take orders for steel rails at \$10 per ton, f.o.b. Chinese ports." The most remarkable thing about this matter is that it should have been left for our enterprising contemporary to discover. Having made the discovery, however, and duly warned our rail manufacturers of the startling fact that such severe competition is in store for them, we trust that the feelings of other American manufacturers will be spared the harrowing thought of the competition in their branches of trade which is inevitable if the full measure of Chinese industrial progress should be suddenly unfolded to them.

Exports.

The following table presents the exports of Hardware, Iron, Steel, Metals, &c., from the port of New York for the week ending February 14, 1888:

Argentine Republic		Central America.	
	Quan. Val.		Quan. Val.
Hdw., pkgs.,	143 2,690	Hdw., cs.,	26 204
Ag. imp., pkgs.	102 2,775	Mach'y, pkgs.	1358 17,876
Sew. ma., cs.,	67 1,700	Ag. imp., pkgs.	7 148
W. mills, pkgs.	301 5,914	Clocks, pkgs.	17 648
Pumps, pkgs.	13 348	Ox shoes, cs.,	25 304
Mch'y, pkgs.,	65 1,017	Quick silver	
Ag. imp., cs.,	10 178	flasks,.....	2 110
Tinware, cs.,	54 2,917	Cutlery, cs.,	15 416
Clacks, cs.,	3 58	Firearms, cs.,	1 290
Granite ware,		Pumps, pkgs.,	2 324
cs.,.....	15 1,018	Steel pkgs.,	10 103
Antwerp.		Mf. iron, pkgs.	394 1,280
Mach'y, pkgs.,	94 800	Cartridges, cs.,	501 7,285
Hdw., pkgs.,	103 2,705	Copper rivets,	
Ag. imp., pkgs.	6 270	case,.....	1 15
Sew. ma., cs.,	12 112	Steel rails,.....	74 325
Clocks, cs.,	3 93	Cuba.	
Belfast.		Mf. iron, pkgs.	691 8,195
Mach'y, pkgs.	5 1,500	Hdw., pkgs.,	160 2,198
British Australia.		Boiler,.....	1 115
Hdw., pkgs.,	1022 15,900	Nails, kegs.,	472 1,125
Mach'y, pkgs.	122 10,206	Mach'y, pkgs.	126 6,031
Sew. ma., cs.,	390 8,822	Cutlery, cs.,	59 1,197
Clocks, pkgs.,	249 4,520	Ag. imp., pkgs.	12 480
Wringers, cs.,	67 1,672	Clocks, pkgs.,	8 109
Guns, cs.,	21 1,541	Tinware, cs.,	9 134
Washing ma-		Nails, cs.,	41 305
chines, cs.,	6 68	Sew. ma., cs.,	17 463
Mf. iron, pkgs.	390 2,760	spikes kgs.,	824 788
Tinware, cs.,	7 220	Tin, boxes,.....	25 251
Ag. imp., pkgs.	271 5,345	Tacks, cs.,	13 113
Pumps, pkgs.	7 281	Brass goods,	
Cartridges, cs.,	528 9,592	cases,.....	4 81
Nails, kegs.,	82 282	Wire goods,	
Nails, cs.,	37 229	cases,.....	4 85
Revolvers, cs.,	2 475	Car wheels,.....	15 105
Cutlery, cs.,	145 1,331	Christiania.	
Car wheels,.....	14 400	Hdw., cs.,	19 429
Bradford.		Wringers, cs.,	8 128
Mf. iron, pkgs.	11 600	Clocks, pkgs.,	10 283
British West Indies.		Crefeld.	
Hdw., pkgs.,	50 728	Mach'y, pkgs.	1 250
Mf. iron, pkgs.	29 649	Dutch East Indies.	
Nails, kegs.,	17 60	Hdw., cs.,	1 25
Y. metal, cs.,	1 18	Dutch Guiana.	
Sheet zinc, cs.,	1 11	Hdw., cs.,	44 348
Wash. mach.,	1 14	Dublin.	
Sew. ma., cs.,	5 138	Ag. imp., pkgs.	3 52
Nails, cs.,	39 124	Cartridges, cs.,	3 81
Mach'y, pkgs.,	6 186	Hdw., cs.,	32 397
Ag. imp., pkgs.	8 50	Danish West Indies.	
Brass goods,		Mf. iron, pkgs.	15 505
cs.,.....	5 18	Hdw., cs.,	8 119
Gran. ware, cs.,	1 29	Mach'y, pkgs.	2 152
Copper pots,		Ecuador.	
bbil,.....	1 50	Hdw., cs.,	48 946
Tacks, cs.,	3 19	Mf. of copper,	
Brazil.		case,.....	1 12
Sew. ma., cs.,	15 318	Mch'y, pkgs.,	12 710
Cutlery, cs.,	91 1,679	Cutlery, cs.,	20 966
Nails, kegs.,	44 57	Sew. ma., cs.,	2 60
Hdw., pkgs.,	40 526	Mf. iron, pkgs.	6 32
Mf. iron, pkgs.	23 103	Metal goods,	
Nails, cs.,	3 10	case,.....	1 65
Cartridges, cs.,	8 170	Copper coils,	
Fire arms, cs.,	3 451	cta,.....	2 380
Boiler,.....	1 98	French Possessions	
Bremen.		in Africa.	
Hdw., cs.,	5 442	Hdw., cs.,	2 18
Ag. imp., pkgs.	9 610	French Guiana.	
Mf. iron, pkgs.	3 59	Hdw., cs.,	1 14
Bordeaux.		Cutlery, cs.,	2 45
Copper, kegs.	532 86,700	Genoa.	
Mach'y, pkgs.	15 3,710	Mach'y, pkgs.	18 1,425
British East Indies.		Hdw., cs.,	1 48
Clocks, cs.,	10 189	Pumps, pkgs.	2 101
Cartridges, cs.	5 163	Gibraltar.	
Bilbao.		Clocks, cs.,	8 110
Windmill,.....	1 323	Hdw., cs.,	1 24
British Possessions		Glasgow.	
in Africa.		Clocks, bxs.,	14 244
Mach'y, pkgs.	1 20	Hdw., cs.,	22 485
Hdw., cs.,	212 2,863	Pumps, pkgs.	2 88
Mf. iron, pkgs.	335 1,581	Havre.	
Granite ware,		Sew. ma., cs.,	102 4,545
cs.,.....	3 125	Mf. iron, pkgs.	35 470
Wash. ma., cs.	6 74	Copper, bars.	545 30,800
Nails, kegs.,	116 808	Firearms, cs.,	3 1,325
Ag. imp., pkgs.	334 5,403	Mach'y, pkgs.	10 436
Cutlery, cs.,	2 27	Copper, ckes.	6 1,000
Sew. ma., cs.,	4 220	Ag. imp., pkgs.	107 2,606
Pumps, pkgs.	1 5	Hayti.	
Cape de Verde Is.		Hdw., pkgs.,	47 405
Clocks, cs.,	3 73	Cutlery, cs.,	1 19
Ag. imp., pgs.	6 29	Nails, bxs.,	49 72
Wire rope, coil	1 25	Nails, kegs.,	3 227
Nails, kegs.,	40 94	Mach'y, pkgs.	4 51
Chili.		Sew. ma., cs.,	48 925
Mf. iron, pkgs.	23 183	Iron, bars,.....	20 55
Boiler,.....	1 300	Zinc, cs.,	2 189
Mach'y, pkgs.	2 180	Mf. iron, pkgs.	48 232
Pump,.....	1 160	Hamburg.	
Hdw., cs.,	2 27	Ag. imp., pkgs.	230 4,183
Brass goods,		Metalware, cs.	1 50
case,.....	1 91	Firearms, cs.	1 360
Copenhagen.		Mach'y, pkgs.	7 1,120
Hdw., cs.,	5 78	Mf. iron, pkgs.	2 23
Clocks, pkgs.	49 748	Hong Kong.	
Ghent.		Hdw., cs.,	85 1,765
W. mill mat.,		Clocks, cs.,	9 445
pkgs.,.....	5 79	Sew. m. cs.	1,760 49,188

Japan.		Nevada.	
	Quan. Val.		Quan. Val.
Hdw., cs.,	85 1,765	Mach'y, pkgs.	2 75
Clocks, cs.,	9 445	Nails, cs.,	215 4,255
Sew. m. cs.	1,760 49,188	Ag. imp., pgs.	53 1,577
Hong Kong.		M. iron, pkgs.	340 2,319
Mf. iron, pkgs.	3 71	Tinware, cs.,	3 86
Leipsic.		Car wheels,.....	24 160
Hdw., cs.,	2 171	Guns, cs.,	1 30
Leghorn.		Oporto.	
Ag. imp., pkgs.	15 410	Pumps, pkgs.	9 310
Cop. mtl. sks.,	5,924 36,000	Clocks, bxs.,	48 925
Lisbon.		Mf. iron, pkgs.	27 409
Mach'y, pkgs.	28 750	Hdw., pkgs.,	7 75
Leith.		Pera.	
Ag. imp., pkgs.	15 570	Sew. ma., cs.,	2 96
Hdw., cs.,	8 144	Brass, cs.,	1 47
Wash. mas, cs.	8 56	Hdw., cs.,	50 985
Liverpool.		Mf. iron, pkgs.	2 113
Ag. imp., pkgs.	17 450	Cartridges, cs.,	5 108
Hdw., cs.,	19 464	Copper, cs.,	5 150
Springs, bbls.	10 425	Mach'y, pkgs.	1 100
Clocks, pkgs.,	189 1,083	Rotterdam.	
Sew. mach, cs.	52 377	Mf. steel, cs.,	5 164
Mach., pkgs.,	221 13,265	Copper cks.,	71 18,100
Arms, cs.,	3 430	Santo Domingo.	
Cutlery, cs.,	1 87	Hdw., pkgs.,	95 1,075
Mf. iron, pkgs.	7 200	Nails, kegs.,	50 120
Copper, pkgs.,	303 16,800	Tinware, cs.,	3 125
Brass goods,		Metal, cs.,	2 160
cs.,.....	7 425	Mf. cop., cs.,	2 136
Cop. matte,		Sew. ma., cs.,	4 116
bags,.....	15,200 105,291	Mach'y, pkgs.	61 725
Nails, kegs.,	10 22	Mf. iron, pkgs.	180 632
London.		Locomotive,.....	1 2,791
Ag. imp., pkgs.	53 234	Cutlery, cs.,	7 148
Wire, bbls.,	2 217	S. pumps,.....	2 500
Hdw., cs.,	2 801	Steel bars,.....	6 22
Guns, cs.,	2 229	Iron, bbls.,	52 69
Sew. mach, cs.	10 186	Stuttgart.	
Clocks, pkgs.	327 9,373	Valves, bxs.	21 2,152
Mf. iron, pkgs.	9 300	Tayaurog.	
Arms, cs.,	2 301	Ag. imp., pkgs.	15 1,350
Mach., pkgs.,	2 199	Hdw., cs.,	9 880
Mexico.		Pumps, pkgs.	14 361
Hdw., pkgs.,	62 1,797	Uruguay.	
Tin plate, bxs.	30 128	Clocks, cs.,	27 480
Pumps, pkgs.,	8 401	Firearms, cs.,	2 1,861
Mf. iron, pkgs.	474 2,896	Ag. imp., pkgs.	2 45
Nails, kegs.,	138 418	United States of	
Cutlery, cs.,	64 1,537	Colombia.	
Nails, bxs.,	16 139	Mf. iron, pkgs.	262 1,940
Copper goods,		Sew. ma., pkgs.	128 2,871
cs.,.....	2 72	Cutlery, cs.,	34 399
Clocks, pkgs.	4 132	Tinware, cs.,	10 415
Mach., pkgs.,	336 11,080	Iron, pkgs.,	829 5,042
Ag. imp., pkgs.	39 5 5	Boiler,.....	1 505
Arms, cs.,	6 1,870	Chain, lgths.,	3 176
Sew. ma., cs.,	68 903	Ag. imp., pkgs.	2 17
Jacks, cs.,	43 360	Clocks, cs.,	14 477
Cartridges, cs.	40 884	Car wheels,.....	4 32
Boiler tubes,	35 35	Hdw., pkgs.,	114 1,533
Y m sheath g		Mach'y, pkgs.	53 3,672
cs.,.....	4 380	Steel, pkgs.,	194 695
Miquelon.		Br. gds., pkgs.	400 2,176
Tinware, cs.,	5 115	Nails, kegs.,	85 77
Cutlery, case,	1 20	Gran'tw re, cs.	1 129
Nails, kegs.,	40 87	Vienna.	
Madrid.		Mach'y, pkgs.	9 975
Mach., pkgs.,	2 51	Zurich.	
Naples.		Hdw., cs.,	21 433
Pumps, pkgs.	5 170	Venezuela.	
New Zealand.		Hdw., pkgs.,	20 443
Cutlery, cs.,	44 621	Cutlery, cs.,	11 450
Hdw., pkgs.,	397 5,620	Sew. ma., cs.	10 204
Wringers, cs.,	35 688	Nails, cs.,	1 25
Pumps, pkgs.	8 378	Iron roofs,	
Sew. ma., cs.	15 180	sheets,.....	500 725
Clocks, cs.,	13 280	Mf. iron, pkgs.	671 4,307
		Cartridges, cs.	2 47
		Mach'y, pkgs.	51 1,712

The coke operators in the Connellsville region have taken steps to maintain the present price of coke and also to prevent overproduction if possible. A well-attended meeting was held in the offices of the old syndicate in the Lewis Block, Pittsburgh, on Monday, the 13th inst. The following resolutions were passed unanimously: "Whereas, Shipments of coke to points east of the Connellsville region have been ordered entirely suspended, and requests made to reconsign cars now loaded to Eastern destinations; and, Whereas, Many of the works in the region have been unable to secure enough cars to prevent stocking coke on yards; therefore be it Resolved, That a shut-down of 25 per cent. of the ovens in the Connellsville region be ordered to take effect so that this number of ovens be out of blast not later than Thursday, 16th inst." There are 12,468 ovens in the Connellsville region and this action will effect 3117 ovens and throw over 1500 men out of employment. The output of the region will thus be reduced about 7000 cars per month.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira.....	19.3
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Milreis (Portugal).....	\$1.8
Milreis (Brazil).....	54.8
Mark (Germany).....	23.8
Pounds.....	220.5
Kilogram.....	134.
Picul.....	134.

GREAT BRITAIN.

Pig Iron.—The Pig Iron trade has been quiet and dull. In the North of England business has been inactive. The quotation of middlemen is 33/ for No. 3 for early delivery, but can only be realized with difficulty, about 32/6 being quoted to June. In Lancashire and elsewhere there is little business doing, and prices show next to no change. There has been more activity in the Hematite trade of the Northwest, and the tone of the market has improved, but prices remain low. The Glasgow warrant market has been dull, and prices to-day close as follows: 40/2 @ 40/2½, cash, and 40/4 @ 40/5, one month.

Finished Iron.—The Finished Iron trade of the North of England remains unchanged, Plates being £5, Angles £4.12/6, and Bars £4.17/6. At the annual meeting of the trade the output for 1887 was stated to be 268,796 tons, against 284,188 tons in 1886, and the realized price was practically the same in both years. In Lancashire trade is fairly busy and prices are firm. The trade of East Worcestershire is rather less satisfactory. The demand in North Staffordshire is scarcely so brisk, but rates are well supported. In South Staffordshire Sheets are in good demand at £6.5/ @ £6.10/ for singles, £6.15/ @ £7 for doubles, and £7.15/ @ £8 for lattens. Bars have been in increased consumption, and Common Bars are about £5. The Finished Hardware trades show a little more activity. The Tin-Plate trade remains unsettled.

Steel.—The Steel trade generally has shown more activity. In the Northwest there is a largely increased number of inquiries for all classes of Rails; but prices have not changed, and heavy sections of Rails are quoted at £4 net, f.o.b., with lighter sections up to £4.5/. Blooms are in better inquiry. Prices are quoted at £3.12/6 @ £3.15/. In the Billet trade there is a good inquiry, and prices range from £4.2/6 for Slabs to £4.5/ for Billets. Bars are in good demand and the mills are busy. Steel Wire is in good demand, and also Hoops. In the North of England no material change has occurred except that Rails are lower at £4. On the Tyne Steel Ship Plates remain firm at £7 @ £7.2/6, and Angles at £6.10/6 @ £6.12/6. In railway material the demand is fully maintained, and the Cutlery, Edge Tool and plated industries continue busy. Engineers and shipbuilders are actively employed.—*Economist*, February 4.

WEST INDIES.

PORT OF SPAIN, TRINIDAD, January 6, 1888.—**Asphaltum.**—Has been in steady request at \$13.25 per ton, Boiled, and \$5.50 Crude. During last year there have been exported 74,122 tons, against 104,171 in 1876 and 80,724 in 1885. *Exchange*, 90 days, London, \$4.77 @ \$4.83.—*E. P. Masson*.

BRAZIL.

PARA, December 17, 1887.—India Rubber.—During the week our market has been ill sustained, owing to the advance in exchange. Fine selling at 2400 reis per kg. and Coarse at 1500. The steamers Portuguese and Terome leave for New York, the first with 376,389 kg. on board, the other with 88,964, in transit from Manaus. January 2, 1888.—Since the foregoing was written greater animation has prevailed at 2600 reis for Fine and 1700 for Coarse Amazon Rubber, and 2500 and 1600, respectively, for Rubber from the islands. Chief holders decline to go on selling for the same rate, and it is probable that the price will advance. The December receipts of India Rubber in this market have amounted to 1,860,770 kg., while the export reached 1,670,940. *Exchange*, 23½d. Additional per cable direct, dated February 3d. Receipts are falling off and will not exceed 1300 tons in February.—*O. Commercio*.

EAST INDIES.

SINGAPORE, December 24, 1887.—Tin.—After a decline to \$54 it has been more sparingly offered, causing an improvement to \$55.75 per picul. Sales, 130 tons. For January and February delivery \$54.30 and \$53 has been paid. Since January 1st 122,405 piculs were shipped to England, 27,213 to the Continent and 55,759 to the United States. **India Rubber.**—Borneo was sold in a small way from \$30 to \$54 per picul, as to quality. **Gutta-percha.**—Has been in brisk demand and several lots of fine quality have been taken at firm rates. We quote Prime, \$77 @ \$82; Medium, \$40 @ \$70, and White, \$18 @ \$39. *Exchange*, 4 months' bank, 3/2½.—*Gillilan, Wood & Co.*

PENANG, December 27, 1887.—Tin.—During the fortnight opened at \$55.75 in order to recede subsequently to \$54.15. Later on \$55.50 were paid, which is the closing figure. Receipts amounted to 10,000 piculs, sales to 12,800 for Europe and 400 for China. Total export so far this year, 155,396 piculs to England, 3750 to the Continent and 15,500 to the United States. **Gutta-percha.**—No. 1 ranges between \$60 and \$100, and **India Rubber** between \$60 and \$70. *Exchange*, four months' bank, 3/2½.—*Schmidt, Kustermann & Co.*

MANILA, January 23, 1888.—Hemp.—Fair current is quoted £30.5/, cost and freight, against £31.6/ a week ago. Week's receipts 13,000 bales, making a total of 26,000 bales since January 1. *Exchange*, 3/8.—*Smith, Bell & Co.*

CALCUTTA, February 10, 1888.—Petroleum.—The India Council has passed the Petroleum bill, with the provision that the duty be assessed by the gallon instead of ad valorem.—*Per cable direct.*

SPAIN.

BILBAO, January 21, 1888.—Iron Ore.—The demand has been both steady and considerable for both Campanil and Rubios, but chiefly running on the former, which is scarce and has brought as much as 7/9 @ 8/. Rubios have been fluctuating between 6/10 and 7/3. There being a great many steamers taking cargo during the week, great impulse has been given to the export movement, still even more could have been shipped if the Triano Railroad had displayed as much activity as the other mining lines, chief among which was that of the Preonera Iron Ore Company which shipped 25,000 tons. Total shipments since January 1, 178,082 tons, against 194,425 during the corresponding period of last year. **Pig Iron.**—There have been exported during the week 682 tons, while coastwise only 47 tons were shipped.—*Bilbao Maritimo y Comercial*.

GREECE.

ATHENS, January 31, 1888.—Lead.—Since the advance in this metal there is a prospect that the shares of the Laurium Lead mine will in future prove a more paying property to hold. The capital of the company, which was founded in 1873, consists of 100,000 shares of 200 francs, representing together the sum of 20,000,000 francs, of which 14,000,000 francs have been paid in. The dividend has hitherto fluctuated between 3 and 14 francs. For the first six months of last year the dividend was 5 francs. On the 18th inst. the Mobilier Français got the Laurium shares listed on the Paris Stock Exchange at 130 francs.—*Eco.*

GERMANY.

HAMBURG, February 4, 1888.—Iron.—During the week under review the demand for Pig Iron has been very active, so that several blast furnaces will be blown in again. Both Thomas and Forge Pig are in special request since it has become apparent that the production of neither can at present satisfy consumption, hence the price has been raised 2 marks per ton. For some time past, Spiegel has also been more wanted than ever, and an advance of 4 marks per ton has been established. Foundry and Bessemer Pig move off as readily as heretofore; all the raw material for making the same being higher, a speedy raising of the price is contemplated. In the Finished Iron branch, the same animation heretofore noticeable still prevails. The syndicate having sold out the entire outfit for the first quarter, the price is to be advanced to 127.50 marks per ton. Orders for Thin Sheets continue to drop in satisfactorily, although more slowly. A convention is about to be concluded with Silesian makers of the same. Boiler Plates are less lively, but the syndicate figures are nevertheless readily submitted to. As for the Wire branch, it has no reason for complaint, so long as the domestic demand remains as brisk as it is at present, but for export more might be done. In this manner, export lots of Drawn Wire have to go 12 marks per ton lower than for domestic use, because of foreign competition abroad. The Steel works are busy in turning out railroad material for domestic lines; they also received extensive orders for Wire Rods, Billets, &c., hence they are fully able to keep up their capacity of production till spring. Car-makers, machine shops, foundries and structural iron works as well as boiler-makers are sufficiently booked at more remunerative figures. In Upper Silesia, 28 furnaces are in blast. At the same time, rolling mill products, which were rather more quiet a month ago, are now as active as they can be, specifications coming in abundantly. A great demand prevails for Wire Nails under the new convention. **Metals.**—The demand has been satisfactory for all Metals without change in price.—*Borsenhalle*.

BELGIUM.

BRUSSELS, February 4, 1888.—Iron.—The market has been characterized by great firmness in Pig Iron, whereas in Finished business it has decreased. At the high price of Pig Iron

it is becoming difficult for Belgian makers of Beams and other Finished to compete abroad. Rolling mills, not having their own blast furnaces, consequently find themselves in a rather difficult position, which can hardly continue much longer without resulting in injury to their interests. It is true, we are told, that English orders begin to drop in again more copiously, but the bulk are inquiries from there, not bringing along much business. The owners of blast furnaces assert that it is due to the high price of Coke that they are compelled to ask higher prices for Pig. The rolling mill syndicate has ordered no rise in prices. Forge Pig is wanted at 4 francs 50, Foundry being worth 4.80.—*Moniteur Industriel*.

FRANCE.

PARIS, February 4, 1888.—Metals.—With the exception of Spelter, all metals are lower. We quote at the close in francs per 100 kg.: Chili Bars, 192.50 @ 197.50; Ingots and Slabs, 197.50, and Best Selected Copper, 202.50; Tin, Banca, 420; Billiton, 415; Straits, 440, and English, 395; Lead, 38 @ 39, and Spelter, 54.50 @ 56. **Iron.**—The Iron situation in France is somewhat complicated. The Northern rolling mills believing that they can rule the Paris market, have pushed their figures rather high. Merchant being worth at the works 13 francs 50 @ 14 francs, while consumers in this city do not appear ready to pay over 14.50. The rolling mills of Central France have availed themselves of this circumstance by slightly underselling at Paris their Northern competitors; in this manner the Creusot, the Châtillon-Commeny and the Franco-Comté have made several sales among us. Dealers in this city are selling Beams at 13.50, and Merchant Iron at 14.50. The city rolling mills will probably make an effort and undersell all their competitors. In October last, the consumption in this city of Structural Iron has been 3253 tons, against 4128 tons in October, 1886; of Pig Iron it was 2396 tons compared with 3162 the previous year. The French Chamber of Deputies has decided by 274 votes against 207 to suppress the "acquits à caution" system and replace the system of the equivalent by that of the real.—*Moniteur des Interets Matériels*.

AUSTRIA.

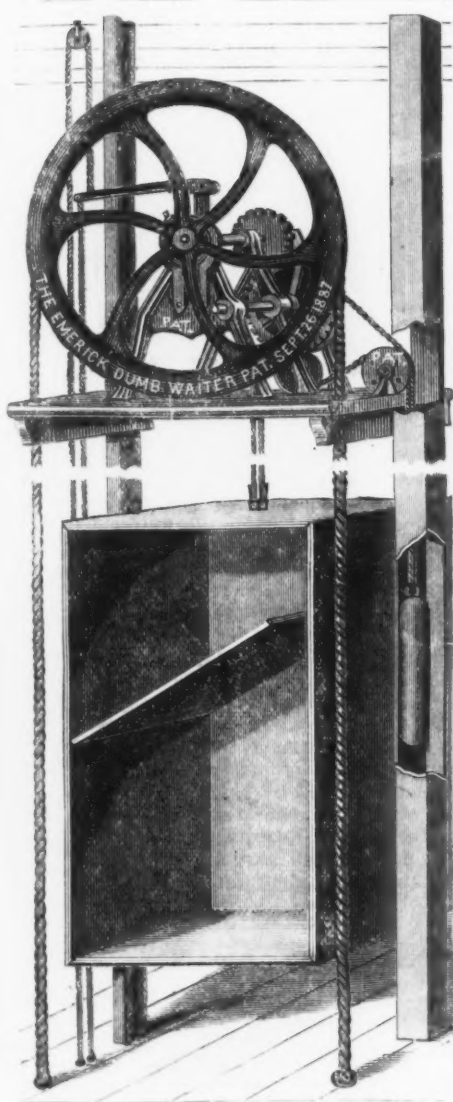
VIENNA, February 2, 1888.—Iron.—In Austria-Hungary the Iron trade has not yet come up to expectations so far this year, which has in some measure been due to the delay of fixing the intended higher prices, in which the syndicate of rolling mill owners think fit to indulge. One thing is certain, however, that the stocks of Finished Iron have run quite low in dealers' and consumers' hands, and from the moment the basis shall have been laid down for the prices that are to rule in the immediate future, a lively trade is pretty much certain to develop. In Hungary the weather has been so bad that the transportation of goods has been impeded thereby. In Bohemia the demand for Hardware and other goods is slack still, but factories and works are busy preparing for the spring trade. Among syndicates about to be formed there is one of Wire Nail manufacturers, while that of Axle makers has been prolonged for two years. We quote Pig Iron 38 @ 47 florins per ton; Merchant, 108 @ 120; Sheets, 145 @ 170, and Beams, 120 @ 125. **Metals** have remained steady; we quote Copper, 90 @ 100 florins per 100 kg.; Lead, 23; Spelter, 29; Tin, 199 @ 200; Antimony, 56, and Quicksilver, 304.—*Handels' Journal*.

English papers give particulars of a small craft which has been built for the Universities African Mission Society, by Messrs. Simpson & Strickland, of Dartmouth, England. The Nyassa, which is intended for service on the lake of that name, is constructed entirely of delta metal, and for convenience of transport she has been built in three sections. She is 21 feet long, with a beam of 7 feet and a depth of 3 feet, and draws 16 inches of water with her engine and boiler on board. The Nyassa was recently tried with seven persons on board. With steam at 100 pounds pressure she made seven miles an hour, and with her sails and wind abeam six miles an hour, dragging her screw, the boat proving very handy. The boiler furnace is adapted for burning wood and other similar fuel found in tropical countries.

A very valuable report, reviewing the history of gunmaking in the United States, has just been issued by the Military Service Institution. It is from the pen of Captain Rogers Birnie, Jr., of the Ordnance Department, United States Army.

Emerick Dumb-Waiter.

The Butler Hardware Company, No. 18 Warren street, New York, are directing special attention to the form of dumb-waiter shown in Fig. 6 of the engravings. It is the invention of Garrett M. Emerick, of Brooklyn, who has assigned his rights to the company. The engraving very clearly shows the features of the article, which is adapted for use in various places. It is particularly useful in flats where coal and other articles are to be hoisted up to the different kitchens by the janitor or delivery clerks. Referring to the box of the waiter, it will be noticed that the shelf is hinged. This is so constructed that the leaf may be thrown up and fastened, thus giving the entire depth to the service of those who employ the

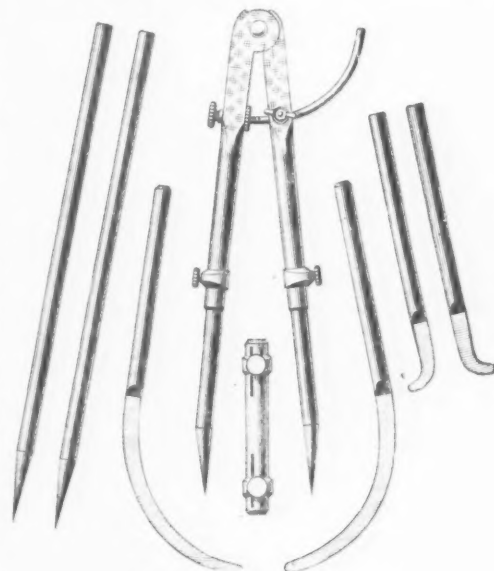
*The Emerick Dumb-Waiter.*

waiter. The counter-balancing weights are run in the standard at the right. The other features will be understood by a very brief description. The propelling power is communicated to the large wheel by the hand rope shown in the foreground. The hoisting is done over a drum, located further back in the mechanism, while a brake for instantly stopping the movement, or of checking the motion to whatever degree desired, is operated by means of the rope shown outside of the left-hand standard. The waiter is of a kind that might be described as back-geared. It is powerful in its operations and easily operated; and what is of quite as much interest to our readers, is readily put in place. Very slight provision is necessary to be made for receiving the mechanism as supplied by the manufacturers. The special

features which distinguish this waiter from others may be briefly alluded to. The main power-shaft is connected by gearing to the shaft which carries the lifting drum. The drive-wheel and its endless rope is combined by this means with the drum. It will be noticed that there are two ropes, both attached to the car, passing over the drum and a guide pulley connected with the weight. One of these is a little longer than the other, causing the shorter one to bear all the weight. In case it should break, the car and weight are prevented from falling by the slack rope. In this manner the slack rope becomes a perfect safeguard against the falling of the car, for when the working rope breaks it is necessary to put a new one in place. The rope is spread on the drum and the pulley is formed with flanges to prevent the coils from running too far apart. In this manner the portions of the rope which reach from the drum to the car are kept from spreading, which would be liable to shift the weight of the car from one end of the rope to the other, and thus necessitate too much slack in the safety rope.

Combination Dividers.

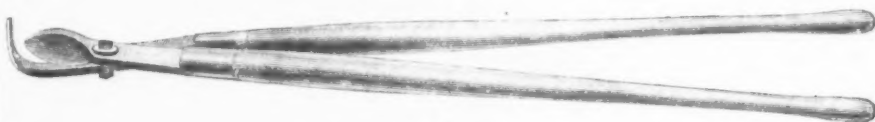
L. S. Starrett, of Athol, Mass., is introducing a combination dividers for wood-workers. In the illustration given herewith, the cut shows the article complete, with the different attachments that are provided to go with it. The article may be used in the form of dividers, with either short or long extension points, and either with or without a pencil. It is also capable of being used as an outside calipers or inside calipers, and also in the form of hermaphrodite calipers. Articles of this kind have been before the public for a long time past, but this instrument, we are informed, possesses features peculiarly its own. The head and socket legs of the tool, we learn, are made from drawn bronze metal, and accordingly are hard, tough and strong. They are, in addition, finely finished. The joint is large and firm, and the quadrant is round and is fastened by an improved method. The steel points are thoroughly tempered. On the threaded end of the quadrant, between the adjustable legs, is a knurled nut, against the inside of which a helical spring acts. After the points are adjusted the nut may be turned back against the leg, thus locking it firmly in place. A common pencil fits either socketed leg, while an auxiliary holder is also furnished to fit the reverse end of either point. The maker claims that this is one of the most useful combinations of its kind, as well as the best made tool ever offered to the trade. In the ordinary form it is supplied with head and points 8 inches. These points, we learn, may be extended 2 inches more and in this form will describe a 24-inch circle.

*Starrett's Combination Dividers.*

tially made and finished in Japan. Its utility for the purpose indicated is referred to, as well as the moderate price at which it is sold.

The Sylvan Pruning Shears.

The illustration herewith given represents the Sylvan pruning shears, with patented hook, manufactured by E. S. & F. Bateman, Spring Mills, N. J. In putting this tool on the market the object of the manufacturers has been to avoid mak-

*The Sylvan Pruning Shears.*

The longer points bring the article up to a capacity of a 34-inch circle, while extra long points, which are supplied to order, describe a 44-inch circle.

A third bridge is to be built, under plans which have been accepted by the Secretary of War, across the Ohio at Louisville, Ky.

It will lead to Jefferson, Ind. The Ohio River there is a mile wide, but it has a rock bottom.

Carriage Wrench.

The Phillips-Getman Company, Hion, N. Y., are putting on the market the Universal Carriage Wrench, which is illustrated below. It is intended, as shown in the cut, for use in oiling a wagon, the nut being held in the manner indicated. There

*The Universal Carriage Wrench.*

is a spring in the head which presses the end of the lever against the side of the nut, so as to hold it firmly in the wrench, a depression of the lever relaxing this pressure so as to open the wrench to grasp or let go of the nut, as desired. This wrench is substan-

ing a heavy and clumsy tool, and to produce one, as they express it, that makes it possible for a fruit grower to go into his berry vines and orchards and work all day with ease. It is stated that it will cut easily limbs up to a size where the saw and axe should come into play. The extending finger is curved at nearly

a right angle to the cutting blade, making a guard and rest to protect the shears from the ground in all low pruning of berry canes, shrubbery, &c., and for hooking out the canes and brush after being cut. The handles and blades are about $3\frac{1}{2}$ feet in length, the entire weight being not over 24 pounds. The fact that the shears are made of cast steel drop forged is also mentioned. With this tool it is stated that from the ground a man can cut 10 feet high, the ease with which the cut and lodged branches can be hooked down being alluded to as a valuable feature.

The Hanika Lawn Mower.

The accompanying illustrations, Figs. 1 and 2, represent a lawn mower made by the Hanika Iron Fence Company, Spring-

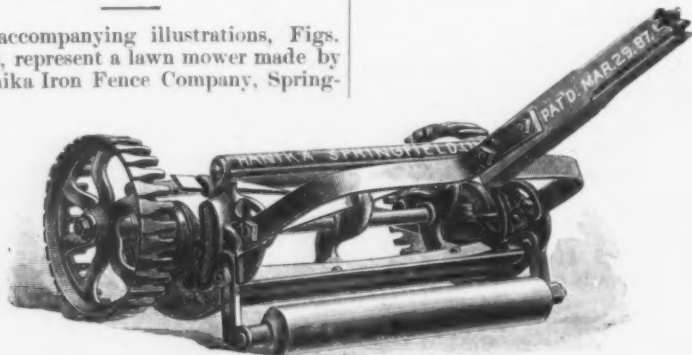


Fig. 1.—Hanika Lawn Mower, Rear Cut.

field, Ohio, embodying, it will be observed, some new features. Fig. 1 shows the mower as a rear-cut machine with roller attachment, while Fig. 2 shows it as a front-cut lawn mower. To produce a high or low cut in the rear-cut machine the roller attachment is adjusted to the proper height, thus raising or lowering the cutter bar to the height of cut desired. This result can also be obtained by shifting the driving-wheels from the front of side plate, as shown in Fig. 1, to the rear, as shown in Fig. 2, the machine by this operation becoming a front-cut mower, as it transfers the cutting reel from the rear to the front. In this case the roller attach-

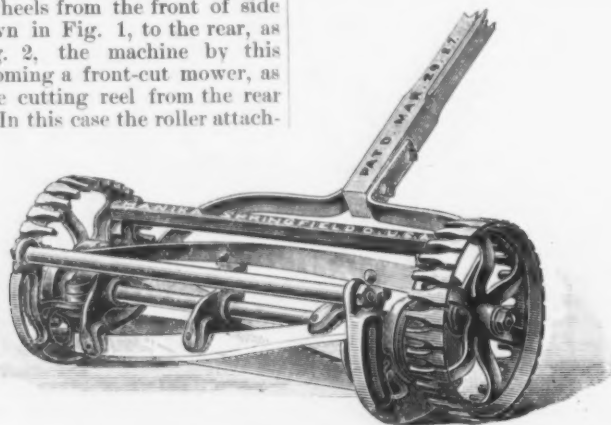


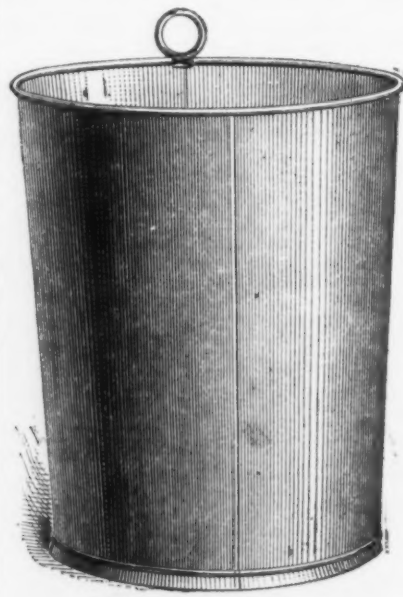
Fig. 2.—Hanika Lawn Mower, Front Cut.

ment must be removed and the handle made rigid by means of the nut and bolt in slot shown at each side of bracket. The company emphasize the fact that this mower is made without springs and internal gears, alluding to the steel pawls as a combination of gravity, friction and force. The housing of the clutch is provided with a sufficient number of ratchets for the pawls to operate in, so that there may be no lost motion. They also make the point that the handle bears directly from the center of the machine, and can be adjusted instantly to suit the operator. The advantages resulting from the fact that the mower can readily be made a front, rear, high, low and angle machine, as described, are alluded to, and the point is made that the machine is especially strong, effective in operation and offered at a low price. The merit of the roller attachment is also alluded to. The mower is made in sizes 12, 14, 16 and 18 inch.

Sap Bucket.

A. H. Whiting, successor to Whiting & Co., 468 and 470 Cherry street, New York, is putting on the market the sap bucket represented in the illustration given below. It is about 11 inches high, and, in lieu of bail or ears, has a loop or ring of wire at the top, the wire of the bucket being taken up in a ring and passed down again for that purpose. The object of this loop is to hang the bucket on the tree to the sap spout, which is driven in or otherwise inserted in the wood. The bucket, as regularly made, is 10 or 12 quart, but will be made of other sizes if re-

quired. The top diameter is greater than at the bottom, so that the buckets nest solidly for shipping, although higher and less flaring than the ordinary 12-quart water pail. They are described as made over a stamped bottom of good sound iron, and, like Mr. Whiting's other wares, are made up in the black iron and galvanized afterward, the spelter thus filling the seams



Sap Bucket.

to the right clamp the irons securely, binding the iron portions of the mill above and below the wooden top piece firmly together, making a neat, cheap and durable construction. The mills are all provided with a simple and effective adjustment to set the burr for fine and coarse grinding, so that when adjusted to the proper grade it will retain the set, as the nut cannot turn either way without raising up the thumb-piece to pass the notches. The line of mills made by the company include a variety of patterns mounted on hard and soft wood boxes, finished in different styles. The fact that they embody a number of improvements, are well made, nicely finished and attractive in appearance, are points that are mentioned as



The Imperial Coffee Mill, No. 177.

adapting them to the requirements of the trade. Information in regard to prices is given in the Trade Report.

The industrial school of Tuskegee, Ala., has 400 students. The curriculum includes saw-mill work, carpentry, brick-making, &c. In Tulane University, Louisiana, there has been opened lately a similar school.

New Coffee Mills.

The Arcade Mfg. Company, Freeport, Ill., for whom J. C. McCarty & Co. are agents, 97 Chambers street, New York, are putting on the market a line of Coffee Mills, one of which, a recent addition, is represented in the accompanying illustration. These mills include both sunk and raised hopper mills, with and without cover, the illustration showing their No. 177 sunk hopper without cover. This mill has, it will be observed, a large flange in the center located well down in the hopper for the purpose of preventing coffee from snapping out when crushing, a

CURRENT HARDWARE PRICES.

FEBRUARY 15, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.

Caps, Perfection, 1000—		
Edwards & Goldmark's		
F. L. Waterproof, 1-10's	50¢	dis 27¢
E. B. Trimmered Edge, 1-10's	55¢	25¢
E. B. Ground Edge, Central Fire, 1-10's	70¢	75¢
Double Waterproof, 1-10's	1.40	
Blank Waterproof, 1-10's	52¢	53¢
G. D.	53¢	54¢
S. B.	30¢	
Union Metallic Cartridge Co.		
F. C. Trimmered	50¢	
F. L. Ground	65¢	dis 25¢
Cent. Fire Ground	70¢	25¢
Double Waterproof	1.40	75¢
Double Waterproof, In 1-10's	1.40	
A. B. Genuine Imported	45¢	
Eley's E. B.	54¢	56¢
Eley's D Waterproof, Central Fire	1.60	

Cartridges—

Rim Fire Cartridges	dis 50¢ & 52¢
Rim Fire Military Cartridges	dis 15¢ & 2¢
Cent. Fire Cartridges, Pistol and Rifle	dis 25¢ & 2¢
Cent. Fire Cartr., Military & Sporting	dis 15¢ & 2¢
Blank Cartridges, except 22 and 32 cal., an additional 10¢ over above discounts.	
Blank Cartridges 22 cal.	1.75, dis 2¢
Blank Cartridges, 32 cal.	3.50, dis 2¢
Primed Shells and Bullets	dis 1¢ & 2¢
R. B. Caps, Round Ball	1.75, dis 2¢
R. B. Caps, Conical Ball, Swaged	2.00, dis 2¢
Primers	
Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells)	1.00, dis 2¢
All other Primers, all sizes	1.20, dis 2¢

Shells—

First quality, 4, 8, 10 and 12 gauge	dis 25¢ & 10¢ & 2¢
Star quality, 14, 16 and 20 gauge (10 list)	dis 10¢ & 2¢
Star, Club, Rival and 10 gauge, 10 list	dis 31¢ & 10¢
Climax Brands, 12 gauge, 10 list	2¢
Club, Rival and Climax Brands, 14, 16 and 20 gauge	dis 30¢ & 10¢ & 2¢
Selbold's Combination Shot Shells	dis 15¢ & 2¢
Brass Shot Shells, 1st quality	dis 60¢ & 2¢
Brass Shot Shells, Club, Rival & Climax	dis 65¢ & 2¢

Shells Loaded—

List No. 19, 1887	dis 20¢ & 10¢
Wags—	
U. M. C. & W. R. A.—R. E., 11 up	2.00
U. M. C. & W. R. A.—R. E., 9 & 10	2.30
U. M. C. & W. R. A.—R. E., 7 & 8	2.60
U. M. C. & W. R. A.—R. E., 5 & 6	2.90
U. M. C. & W. R. A.—R. E., 4 & 5	3.20
U. M. C. & W. R. A.—R. E., 3 & 4	3.50
Eley's B. E., 11 up	1.75
Eley's P. E., 11 & 20	2.80

Anvils—

Wright's—Eagle Anvil	10¢, dis 20¢ & 20¢ & 5¢
Armstrong's Mouse Hole	11¢
Armstrong's Mouse Hole, Extra	11¢
Trenton	11¢
Wilkinson's	11¢
J. & Riley Carr. Patent Solid	11¢
Anvil Vice and Drill—	
Millers Falls Co.	18.00, dis 20¢
Onesey Anvil and Vice	dis 25¢
Allen Combined Anvil and Vice	33, dis 40¢ & 10¢
Moore & Barnes Mfg. Co.	dis 33¢ & 5¢

Augers and Bits.

Douglas Mfg. Co.	
New Haven Copper Co.	
Wm. A. Ives & Co.	dis 70¢ & 70¢ & 5¢
Humphreysville Mfg. Co.	
French, Swift & Co. (F. H. Beecher)	
Connecticut Valley Mfg. Co.	
Cook's, Douglas Mfg. Co.	dis 55¢
Cook's, New Haven Copper Co.	dis 50¢ & 10¢ & 60¢ & 10¢ & 5¢
Ives' Circular Lip	dis 60¢
Patent Solid Hole	dis 30¢
C. E. Jennings & Co., No. 10, extension 1' p.	dis 40¢
C. E. Jennings & Co., No. 30	dis 60¢
C. E. Jennings & Co., Auger Bits, in fancy boxes	
Wet, 32¢, quarter, No. 5, 6; No. 36, 7	dis 20¢
Lewis' Patent Single Twist	dis 45¢
Bussell Jennings' Augers and Bits	dis 25¢
Imitation Jennings' Bits (new list)	dis 60¢ & 5¢
Pugh's Black	dis 20¢
at Bits	dis 50¢ & 10¢ & 60¢
C. Hommedieu Car Bits	dis 15¢ & 10¢
Forstner Pat. Auger Bits	dis 10¢

Hollow Augers—

Ives	
French, Swift & Co.	dis 25¢ & 10¢
Douglas	25¢ & 10¢ & 5¢
Bonney's Adjustable	dis 40¢ & 10¢
Stearns	dis 20¢ & 10¢
Ives' Expansive, each \$4.50	dis 50¢ & 10¢
Universal Expansive, each \$4.50	dis 20¢
Wood's	dis 25¢ & 10¢

Expansive Bits—

Clark's small, 18; large, 32	dis 35¢ & 55¢ & 5¢
Ives' No. 4, per doz., 900	dis 35¢ & 40¢
Swan's	dis 40¢
Stearns' No. 1, 22; No. 2, 32	dis 35¢
Stearns' No. 2, 48	dis 20¢

Common Bits—

Common	gross \$2.75—dis \$2.25
Diamond	gross \$1.10—dis \$1.10
"Dee"	dis 25¢ & 25¢ & 5¢
Double Cut, Shepardson's	dis 45¢ & 5¢
Double Cut, Ct. Valley Mfg. Co.	dis 30¢ & 10¢
Double Cut, Hartwell's, 7/8 gro.	dis 30¢ & 30¢ & 5¢
Double Cut, Douglas	dis 40¢ & 10¢
Double Cut, Ives	dis 60¢ & 60¢ & 5¢

Bit Stock Drills—

Morse Twist Drills	dis 50¢ & 10¢ & 5¢
Standard	dis 50¢ & 10¢ & 5¢
Cleveland	dis 50¢ & 10¢ & 5¢
Syracuse, for metal	dis 50¢ & 10¢ & 5¢
Syracuse, for wood (wood list)	dis 30¢ & 30¢ & 5¢
Williams' or Holt's, for metal	dis 50¢ & 10¢ & 10¢
Williams' or Holt's, for wood	dis 40¢ & 10¢

Ship Augers and Bits—

L. Hommedieu's	dis 15¢ & 10¢
Watrous's	dis 15¢ & 10¢
Small's	dis 15¢ & 10¢
Small's Ship Auger Pattern Car Bits	dis 15¢ & 10¢

Awl Huts—

Sewing, Brass Ferule	\$3.50 gross—dis \$4.10
Patent Sewing, Short	\$1.00 gross—dis \$0.40
Patent Sewing, Long	\$1.20 gross—dis \$0.40
Patent Peg, Plain Top	\$1.00 gross—dis \$0.40
Patent Peg, Leather Top	\$1.20 gross—dis \$0.40

Awls, Brad Sets, &c.

Wls, Sewing, Common	gross \$1.70—dis 35¢
Wls, Shouldered Peg	gross \$2.45—dis 40¢ & 40¢ & 10¢
Wls, Patent Peg	gross \$3.50—dis 40¢ & 40¢ & 10¢
Wls, Shouldered Brad	\$2.70 gross—dis 35¢
Wls, Handled Brad	\$7.50 gross—dis 45¢
Wls, Handled Scratch	\$7.50 gross—dis 35¢ & 10¢
Wls, Socket Scratch	\$1.50 gross—dis 25¢ & 30¢

Awls and Tool Sets.

Allen's Sets, Awls & Tools, No. 20	gross \$10—dis 50¢ & 10¢
Tray's Ad. Tool Hds., Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	
Miller's Falls Adj. Tool Hds., Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	
Brad Sets, Stanley's Excelsior, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	
Brad Sets, Stanley's Excelsior, No. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	

Axes.

Makers' and Special Brands—	
First quality	gross \$6.25—dis \$5.50
Others	gross \$5.75—dis \$5.00

Axle Grease.

Fraser's, in bulk	Keg \$ 4; Pail, 5¢ net
Fraser's, in boxes	gross \$9.50
Dixon's Everlasting, in bxs.	gross \$1.20; 1 lb., \$1.20; 2 lb., \$2.40
Dixon's Everlasting, 10 lb. pails, each	85¢
Lower grades, special brands	gross \$5.50—dis \$7

Axles—

No. 1, 4¢ & 4½¢; No. 2, 5¼¢ & 5½¢	
10 to 18	dis 40¢ & 10¢ & 50¢
19 to 22	dis 60¢ & 10¢ & 60¢ & 10¢
National Wrought Steel Tubular Self-Oiling	
Standard Farm (1 to 5) and Special Farm (1 to 5)	dis 33¢ & 5¢
Over 10 sets	dis 33¢ & 5¢
XX Strong Exps. (6 to 9), & XX Strong Truck (10 to 16)	
Less than 10 sets	dis 10¢
Over 10 sets	dis 10¢ & 5¢

Bag Holders.

Sprengle's Pat., 2 doz \$18	dis 60¢
Balances—Spring Balances	dis 50¢
Common 24 lb.	dis 50¢
Chattillon's Spring Balances	dis 50¢
Chattillon's Circular Spring Balances	dis 50¢

Bells.

Light Brass	dis 70¢ & 10¢
Extra Heavy	dis 60¢ & 10¢
White Metal	dis 60¢ & 10¢ & 10¢
Silver Chime	dis 25¢ & 10¢ & 5¢
Globe (Cone's Patent)	dis 25¢ & 10¢ & 35¢
Long, Abbe's	dis 25¢ & 10¢ & 35¢
Long, Yankee	dis 40¢ & 10¢
Long, Barton's	dis 40¢ & 10¢ & 50¢
Crank, Taylor's	dis 25¢ & 10¢
Crank, Brooks	dis 50¢ & 10¢ & 10¢
Crank, Cone's	dis 10¢
Crank, Connel's	dis 20¢ & 10¢
Lever, Sargent	dis 60¢ & 10¢
Lever, Taylor's Bronzed or Plated	dis 25¢ & 10¢
Lever, Taylor's Japanned	dis 25¢ & 10¢
Lever, R. E. & Co's	dis 50¢ & 10¢ & 2¢
Full, Brooks	dis 50¢ & 10¢ & 2¢
Pull Western	dis 25¢ & 10¢

Common Wrought—

Western	dis 20¢ & 10¢
Western, Sargent's list	dis 70¢ & 10¢
Kentucky "Star"	dis 20¢ & 10¢
Kentucky, Sargent's list	dis 70¢ & 10¢
Dodge, Genuine Kentucky, new list	dis 70¢ & 10¢
Star	dis 50¢ & 10¢ & 20¢ & 10¢ & 5¢
all	dis 40¢ & 10¢ & 5¢
Arm Bells	dis 25¢ & 10¢ & 3¢
Steel Alloy Church and School Bells	dis 40¢

Bellows—

Blackamit's	dis 60¢ & 10¢ & 60¢
Molders	dis 40¢ & 10¢ & 60¢
Hand Bellows	dis 40¢ & 10¢ & 60¢

Belting, Rubber.

Common Standard	dis 75¢
Standard	dis 70¢ & 5¢
Extra	dis 60¢ & 10¢
N. Y. & P. Co., Standard	dis 60¢ & 5¢ & 5¢
N. Y. & P. Co., Extra Standard	dis 50¢ & 10¢ & 5¢

Bench Stops.

Worrell's	gross \$9—dis 50¢
Hutchinson's	gross \$5.00—dis 10¢ & 10¢ & 10¢
Weston's, per doz No. 1, 10; No. 2, 20	dis 25¢ & 10¢ & 5¢
McGill's	gross \$5—dis 10¢

Bits—

Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders.

Extension, Barber's	gross \$15.00—dis 40¢ & 40¢ & 10¢
Extension, Ives	gross \$30.00—dis 60¢ & 5¢ & 60¢ & 10¢
Diagonal	gross \$24.00—dis 40¢
Angular	gross \$24.00—dis 40¢ & 5¢

Blind Adjusters.

Domestic	per doz \$3.00—dis 33¢
Excelsior	gross \$10.00—dis 50¢ & 10¢ & 2¢
Washburn's Self-Locking	dis 20¢ & 20¢ & 10¢

Blind Fasteners.

MacKrell's	gross \$1.00—dis 20¢ & 20¢ & 10¢
Van Sand's Screw Pattern	dis 15¢ gross—dis 60¢ & 10¢
Van Sand's Old Pattern	dis 15¢ gross—dis 55¢ & 10¢
Washburn's Old Pattern	dis 15¢ gross—dis 55¢ & 10¢
Washburn's New Pat.	dis 15¢ gross—dis 55¢ & 10¢
Austin & Eddy No. 2008	dis 15¢ gross—dis 55¢ & 10¢
Security Gravity	dis 15¢ gross—dis 55¢ & 10¢

Blind Staples.

Barbed, ¼ in. and larger	gross \$ 8—dis 8¢ & 8¢ & 8¢
Barbed, ¼ in.	gross \$ 9—dis 9¢ & 9¢ & 9¢

Blocks.

Ordinary Tackle, list April 17, '85	dis 40¢
Cleveland Block Co., Mal. Iron	dis 50¢

Boats.

Cast Iron Barrel, Square, &c.	dis 70¢ & 70¢ & 10¢
Cast Iron Shutter Bolts	dis 70¢ & 70¢ & 10¢
Cast Iron Chain (Sargent's list)	dis 60¢ & 10¢
Ives' Patent Door Bolts	dis 65¢
Wrought Barrel	dis 70¢ & 70¢ & 10¢
Wrought Square	dis 70¢ & 70¢ & 10¢
Wrought Shutter All Iron, Stanley's list	dis 60¢ & 10¢
Wrought Shutter, Brass Knob, Stanley's list	dis 40¢ & 10¢
Wrought Shutter, Sargent's list	dis 60¢ & 10¢
Wrought Sunk Flush, Sargent's list	dis 55¢ & 10¢
Wrought Sunk Flush, Stanley's list	dis 40¢ & 10¢ & 5¢
Wrought E. K. Flue, Com'n Stanley's list	dis 55¢ & 10¢

Carriage—

Com. list June 10, '84.....	dis 70¢ & 10¢ & 3 ¢
Genuine Eagle, list Oct. '84.....	dis 75 ¢ @ 75¢ & 5 ¢
Phila. pattern, list Oct. 7, '84....	dis 75¢ & 10¢ @ 75¢ & 10¢ & 5 ¢
H. H. & W. - old list.....	dis 75 ¢

World's Best, # gross, No. 1, \$12.00; No. 2, \$24.00
No. 3, \$36.00.....dis 50&10
Universal.....# dos \$3.00, dis 35&5
Champion.....# dos \$2.50, dis 45
Champion.....# dos \$2.00, dis 50

Cards.
Horse and Curry.....dis 10 @ 10&10
Cotton.....New list, Aug., 1888, dis 10
Wool.....dis 10

Carpet Stretchers.
Cast Steel, Polished.....# dos \$3.25
Cast Iron, Steel Points.....# dos \$1.75
Sockets.....# dos \$1.75
Bullard's.....dis 25 @ 25&10

Carpet Sweepers.
Blissell No. 5.....# dos \$17.00
Blissell No. 7 New Drop Fall.....# dos \$19.00
Blissell Grand.....# dos \$36.00
Grand Rapids.....# dos \$24.00
Crown Jewel.....No. 1, \$18; No. 2, \$19; No. 3, \$20
Magic.....# dos \$15.00
Jewel.....# dos \$17.00
Mystic.....# dos \$15.00
Ottawa.....# dos \$15.00
Garland.....# dos \$18.00
Parlor Queen.....# dos \$24.00
Housewife's Delight.....# dos \$15.00
Queen.....# dos \$16.00
Queen, with band.....# dos \$18.00
Hub.....# dos \$16.00
Cog Wheel.....# dos \$16.00

Cartridges—See Ammunition.
Casters.
Bed.....New list:
Plate.....Brass, dis 55
Shallow Socket.....dis 60
Deep Socket.....dis 60
Tale Casters, list May, 1884.....dis 30&10
Yale, Gem.....dis 60&10
Martin's Patent (Phoenix).....dis 60
Payson's Anti-Friction.....dis 60
"Giant" Truck Casters.....dis 10 @ 10&5
Stationary Truck Casters.....dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s.....dis 70 @ 70&10
Sargent's.....dis 60&10
Hotchkiss.....dis 30
Peck Stow & W. Co.....dis 50&10

Chain.
Trace, 6-10-2, exact sizes, # pair, \$1.03.....dis 50&10&5
Trace, 6-10-3, exact sizes, # pair, .92.....dis 50&10&7
Trace, 7-10-2, exact sizes, # pair, 1.11.....dis 50&10&7
NOTE.—Traces, "Regular" sizes 3¢ net # pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....dis 50&10 @ 50&10&5
American Coll 3-16 ¼ 5-16 ¾ 7-16 ¾.....dis 50&10 @ 50&10&5
In cash lots, 8.50 6.25 5.25 4.60 4.40 4.20 3.95 3.75
Less than cash lots, add ¼¢ @ ¼¢ #.
German Coll, list of June 20, 1887.....dis 60 @ 60&5
Ger. Halter Chain, list of June 20, 1887.....dis 60 @ 60&5
Covert Halter, Hitching and Breast.....dis 50&10
Covert Trace.....dis 50&10
Onelida Halter Chain (old list).....dis 45
Galvanized Pump Chain.....# dos 6¢ @ 6¢
Jack Chain, Iron.....dis 70&10 @ 75
Jack Chain, Brass.....dis 70&10 @ 75

Chalk.
White.....# gro 55¢
Red.....# gro 75¢
Blue.....# gro 90¢
White Crayons.....# gro 12¢ @ 12¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer—
Wetherby and Douglas.....dis 75&10 @ 75, 10&5
P. S. & W.....dis 75&10 @ 75, 10&5
New Haven and Middlesex.....dis 75, 10&5
Mix.....dis 30
Buck Bros.....dis 30
Merrill.....dis 60&10 @ 60&10&5
L. & J. White.....dis 30 @ 30&5
Tanged Firmers.....dis 40&10 @ 50
Tanged Firmers, Spear & Jackson's.....\$4.75 @ \$5.00
Tanged Firmers, Buck Bros.....dis 30
Cold Chisels, # 1.....dis 10¢ @ 10¢

Chucks.
Beach Patent.....each, \$8.00, dis 20
Morse's Adjustable.....each, \$7.00, dis 20 @ 20&5
Danbury.....each, \$6.00, dis 30 @ 30&5
Syracuse, Bala Pat.....dis 25

Clamps.
Providence Tool Co.'s Wrought Iron.....dis 25
Adjustable, Gray's.....dis 20
Adjustable, Lambert's.....dis 20
Adjustable, Snow's.....dis 40&5
Adjustable, Hammer's.....dis 15
Adjustable, Stearns.....dis 20&10
Stearns' Adjustable Cabinet and Corner.....dis 20&10
Cabinet, Sargent's.....dis 60&10
Carriage Makers' Sargent's.....dis 60&10
Eberhard Mfg. Co.....dis 40&10 @ 40&10&5
Warner's.....dis 40&10 @ 40&10&5
Saw Clamps.....See Vices

Clips.
Norway, Axle, ¼ & 5-16.....dis 55&5
Second grade Norway Axle, ¼ & 5-16.....dis 55&5
Superior Axle Clips.....dis 60&5 @ 60&5&5
Norway Spring Bar Clips, 5-16.....dis 60&5
Wrought-Iron Felice Clips.....# 5¢
Steel Felice Clips.....# 5¢

Cockeyes......dis 50

Cocks, Brass......dis 40&10 @ 2

Hardware list......dis 40&10 @ 2

Coffee Mills.
Box and Side, list revised Jan., 1888, dis 50¢ @ 50¢
Selsor's Patent.....\$9.00, \$10.50, dis 25
American, Enterprise Mfg Co.....dis 20&10 @ 30
The "Swift," Lane Bros.....dis 20&10
Webb's Patent.....dis 45

Compasses, Dividers, &c.
Compasse, Calipers, Dividers.....dis 70 @ 70&10
Bemis & Call Co.'s Dividers.....dis 60&5
Bemis & Call Co.'s Compasses & Calipers.....dis 50&5
Bemis & Call Co.'s Wing & Inside or Outside, dis 50&5
Bemis & Call Co.'s Double.....dis 60
Bemis & Call Co.'s (Call's Patent Inside).....dis 30
Excelsior.....dis 50
J. Stevens & Co.'s Calipers and Dividers.....dis 50&10

Coopers' Tools.
Bradley's.....dis 20
Barton's.....dis 20&5
L. & J. White.....dis 20&5
Albertson Mfg. Co.....dis 25
Beatty's.....dis 40 @ 40&5
Sandusky Tool Co.....dis 30 @ 30&5

Corkscrews.
Humason & Beckley Mfg. Co.....dis 40 @ 40&10
Clough's Patent.....dis 35¢ @ 35¢
Howe Bros. & Hulbert.....dis 35

Corn Knives and Cutters.

Bradley's.....dis 10
Wadsworth's.....dis 25

Cradles.—Grain......dis 50&10 @ 60

Crow Bars.

Cast Steel.....# 3 ½¢
Iron, Steel Points.....# 3 ½¢

Curry Combs.

Fitch's.....dis 50&10 @ 50&10&10
Rubber.....# dos \$10.00, dis 20
Perfect.....dis 50

Certain Pins.

Silvered Glass.....net
White Enamel.....net

Cutlery.

Beaver Falls and Booth's.....dis 33¼
Wootenholme.....\$7.75 to \$2

Dampers, &c.

Dampers and Clips, Buffalo.....dis 40
Crown Damper.....dis 40
Excelsior.....dis 40&10

Dividers.—See Compasses.

Dog Collars.

Embossed Coll, Pope & Stevens' list.....dis 30&10
Leather, Pope & Stevens' list.....dis 40
Brass, Pope & Stevens' list.....dis 40

Door Springs.

Torrey's Rod, regular size.....# dos \$1.31
Gray's.....# gro, \$20.00, dis 20
Bee Rod.....# gro, \$20.00, dis 20
Warner's No. 1, # dos \$2.50; No. 2, \$3.30, dis 40&10 @ 50
Gem (Coll), list April 19, 1886.....dis 10
Star (Coll), list April 19, 1886.....dis 10
Victor (Coll).....dis 60 @ 60&10
Champion (Coll).....dis 60&10 @ 60&10&10
Philadelphia.....5 in, \$5.00; 8 in, \$7.75, dis 30
Cowell's.....No. 1, # dos \$18.00; No. 2, \$15.00, dis 50
Rubber, complete.....# dos \$4.50, dis 55&10
Hercules.....dis 50
Shaw Door Check and Spring.....dis 25 @ 30 @ 35
Elliott's Door Check and Spring.....dis 25

Drawing Knives.

Wetherby and Douglas.....dis 75&10 @ 75, 10&5
P. S. & W.....dis 75, 10&5
New Haven and Middlesex.....dis 75, 10&5
Merrill.....dis 60&10 @ 60&10&10
Watrous.....dis 15&10 @ 25
L. & J. White.....dis 20&5
Bradley's.....dis 20 @ 25
Adjustable Handle.....dis 20 @ 25
Wilkinson's Folding.....dis 25 @ 25&5

Drills and Drill Stocks.

Blacksmith's.....each, \$1.60 @ \$1.65
Blacksmith's Self-Feeding.....each, \$7.50, dis 20
Bread, P. S. & W.....dis 40&10
Bread, Wilson's.....dis 40&10
Bread, Millers Falls.....each, \$3.00, dis 25
Bread, Bartholomew's.....each, \$2.50, dis 25&10 @ 40
Bread, Ratchet, Merrill's.....dis 20 @ 20 & 5
Bread, Ratchet, Ingalls's.....dis 25
Bread, Ratchet, Parker's.....dis 30 @ 20&5
Bread, Ratchet, Whitely's.....dis 20
Bread, Ratchet, Weston's.....dis 20 @ 25
Bread, Ratchet, Moore's Triple Action.....dis 25 @ 30
Whitely's Hand Drill, Plain, \$11.00, Adjustable, \$12.00.....dis 20&10
Wilson's Drill Stocks.....dis 1
Automatic Boring Tools.....each, \$1.75 @ \$1.65

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans.

Small sizes.....# 7¢
Large sizes.....# 8¢

Edge Beaters.

Edover.....# dos, \$2.00
National.....# dos \$4.50, dis 35¢
Family (T. & S. Mfg. Co.).....# gro, \$17.00 @ \$18.00
Standard (Standard Co.).....# gro, \$6.00
Kingston (Standard Co.).....# gro, \$6.50
Acme (Standard Co.).....# gro, \$6.00
Duplex (Standard Co.).....# gro, \$18.00
Rival (Stan and Co.).....# gro, \$2.00
Triumph (T. & S. Mfg. Co.).....# gro, \$10.50 @ \$11.50
Advance, No. 1.....# gro, \$10.00
Advance, No. 2.....# gro, \$10.00
Bryant's.....# gro, \$15.00
Ayres' Spiral.....# gro, \$24.00
Paine, Diehl & Co.'s.....# gro, \$24.00
Electric self set, Wollensak's.....dis 15
Bigelow & Dowse.....dis 20
Emery.....No. 4 to No. 54 to Flour, CF

Enamelled and Tinned Ware.—See Hollow Ware.

Escutcheon Pins.

Iron, list Nov. 11, 1885.....dis 50&10 @ 50&10&5
Brass.....dis 60 @ 60&5

Escutcheons.

Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60 @ 60&10
Wood.....dis 25

Faucets.

Fenn's.....dis 40
Bohren's Patent Rubber Ball.....dis 25
Fenn's Cork Stops.....dis 33¼
Star.....dis 60 @ 60&5
Frary's Patent Petroleum.....dis 40&10 @ 50
Wash's Patent Key.....dis 50&10
Anchor Lock.....dis 40&5

Felice Plates.

Metallic Key, Leather Lined.....dis 55&10 @ 60&10
Cork Lined.....dis 70 @ 70&10
Burnside's Red Cedar.....dis 50
Burnside's Cedar, bbl. lots.....dis 50&10
J. Sommer's Best Block Tin Key.....dis 40
J. Sommer's Cork Lined, 1st quality.....dis 50
J. Sommer's Diamond Lock.....dis 40
J. Sommer's Perfection, Fla. Red Cedar.....dis 50
J. Sommer's Goodenough Cedar.....dis 60
Self-Measuring, Enterprise.....# dos \$36.00—dis 20&10
Self-Measuring, Lane's.....# dos \$36.00—dis 25&10
Self-Measuring, Victor.....# dos \$36.00—dis 25&10

Felice Wheels.—Derby and Cincinnati......dis 45&5

Domestic.

Best brands.....dis 60&10 @ 60&10&5
Good brands.....dis 60&10&5 @ 60&10&10
Fair brands.....dis 70 @ 70&10
Heller's Horse Raps.....dis 50&7½ @ 50&10

Imported.

J. & Riley Carr.....List, April 1, 1888, dis 15
J. & Riley Carr Horse Raps.....dis 15
Hose & Gamble.....List April 1, 1888, dis 15
Butcher.....Butcher's list, dis 20
Stubs.....Stubs list, dis 25
Turton's.....Turton's list, dis 20 @ 25
Greaves Horse Raps.....American list, dis 60

Fluting Machines.

Knox, 4-1/2-inch Rolls.....\$3.25 each (dis 35
Knox, 6-inch Rolls.....\$3.60 each (dis 35
Eagle, 3-1/2-inch Roll.....\$2.15, dis 35
Eagle, 5-1/2-inch Roll.....\$2.85, dis 35
Crown, 4-1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$4.50 each, dis 35
Crown Jewel.....6 in., \$2.50 each, dis 35
American, 5 in., \$3; 6 in., \$3.40; 7 in., \$4.50 each, dis 35
Domestic Fluter.....\$1.50 each, net
Geneva Hand Fluter, White Metal.....# dos \$12, dis 25
Crown Hand Fluter, Nos. 1, \$15; 2, \$12.50; 3, \$10, dis 30
Shepard Hand Fluter, No. 85.....# dos \$15.30, dis 40
Shepard Hand Fluter, No. 110.....# dos \$11, dis 40
Shepard Hand Fluter, No. 95.....# dos \$8, dis 40
Clark's Hand Fluter.....# dos \$15.00, dis 35
Combined Fluter and Sad Iron.....# dos \$15.00, dis 30
Buffalo.....# dos \$10.00, dis 10

Fluting Saws......dis 45

Forks.—Hay, Manure, &c., Asso. list......dis 65¢
Hay, Manure, &c., Phila. list.....dis 60 @ 60&5
Plated, see Spoons.

Freezers, Ice Cream.

Shepard's Lightening.....dis 65

Fruit and Jelly Presses.

Enterprise Mfg. Co.....dis 20&10 @ 30
Rens.....# dos \$4.50
Shepard's Queen City.....dis 40

Fry Pans.

Association List.....dis 75 @ 75&10
No. 0 1 2 3 4 5 6 7 8 9 10 11 12
dos \$3.75 4.70 5.30 5.95 6.55 7.50 8.75 10.00 11.25
1000 ft.

Common Hemp Fuse, for dry ground.....\$2.70
Common Cotton Fuse, for dry ground.....2.85
Single Taped Fuse, for wet ground.....4.75
Double Taped Fuse, for very wet ground.....6.00
Triple Taped Fuse, for very wet ground.....7.25
Small Gutta Percha Fuse, for water.....7.50
Large Gutta Percha Fuse, for water.....12.00

Gauges.

Marking Mortise, &c.....dis 60&10
Wire, low list.....dis 10&10
Wire, Wheeler, Madden & Co.....dis 10
Wire, Morse's.....dis 50 @ 50&5
Wire, Brown & Sharpe's.....dis 10 @ 20

Gimlets.—Nail and Spike......dis 50&10&5

"Eureka" Gimlets.....dis 40&10
"Diamond" Gimlets.....# gross \$5.00
Double Cut, Shepardson's.....dis 45 @ 45&5
Double Cut, Ives.....dis 60 @ 60&5
Double Cut, Douglas'.....dis 40&10
"Ree".....# gross \$12, dis 25 @ 25&5

Le Page's Liquid......dis 25 @ 25&5

Line Pins.

Tinned and Enamelled.....dis 40&5 @ 40&10
Family, Howe's "Eureka".....dis 40
Family, L. F. & C.'s "Handy".....dis 50

Grindstone Fixtures.

Sargent's Patent.....dis 70&10
Reading Hardware Co.....dis 30&10

Hack Saws.—See Saws.

Halters.—Covert's Pat. & Jute......dis 50&2
Covert's Hemp Horse and Cattle Tie.....dis 50&2
Covert's Jute Horse and Cattle Tie.....dis 60&10&2

Hammers.

Handled Hammers.

Meadole's.....List Dec. 1, 1885, dis 25 @ 25&10
Buffalo Hammer Co.....List Jan. 15, '87
C. Hammond & Son.....dis 50 @ 50&5
Humason & Beckley.....dis 10
Atha Tool Co.....dis 5
Verree.....dis 5
Magnetic Tack, Nos. 1, 2, 3, 1.25, 1.50 & 1.75, dis 30&10
Nelson Tool Works.....dis 40 @ 40&10
Warner & Nobles.....dis 20 @ 25
Peck, Stow & Wilcox.....dis 40
Sargent's.....dis 35&10

Heavy Hammers and Sledges.

3 lb and under.....# 40¢ (dis 70 @ 70
3 to 5 lb.....# 30¢ (dis 70 @ 70
5 to 8 lb.....# 30¢ (dis 70 @ 70
8 to 10 lb.....# 30¢ (dis 70 @ 70
10 to 12 lb.....# 30¢ (dis 70 @ 70
12 to 14 lb.....# 30¢ (dis 70 @ 70
14 to 16 lb.....# 30¢ (dis 70 @ 70
16 to 18 lb.....# 30¢ (dis 70 @ 70
18 to 20 lb.....# 30¢ (dis 70 @ 70
20 to 22 lb.....# 30¢ (dis 70 @ 70
22 to 24 lb.....# 30¢ (dis 70 @ 70
24 to 26 lb.....# 30¢ (dis 70 @ 70
26 to 28 lb.....# 30¢ (dis 70 @ 70
28 to 30 lb.....# 30¢ (dis 70 @ 70
30 to 32 lb.....# 30¢ (dis 70 @ 70
32 to 34 lb.....# 30¢ (dis 70 @ 70
34 to 36 lb.....# 30¢ (dis 70 @ 70
36 to 38 lb.....# 30¢ (dis 70 @ 70
38 to 40 lb.....# 30¢ (dis 70 @ 70
40 to 42 lb.....# 30¢ (dis 70 @ 70
42 to 44 lb.....# 30¢ (dis 70 @ 70
44 to 46 lb.....# 30¢ (dis 70 @ 70
46 to 48 lb.....# 30¢ (dis 70 @ 70
48 to 50 lb.....# 30¢ (dis 70 @ 70
50 to 52 lb.....# 30¢ (dis 70 @ 70
52 to 54 lb.....# 30¢ (dis 70 @ 70
54 to 56 lb.....# 30¢ (dis 70 @ 70
56 to 58 lb.....# 30¢ (dis 70 @ 70
58 to 60 lb.....# 30¢ (dis 70 @ 70
60 to 62 lb.....# 30¢ (dis 70 @ 70
62 to 64 lb.....# 30¢ (dis 70 @ 70
64 to 66 lb.....# 30¢ (dis 70 @ 70
66 to 68 lb.....# 30¢ (dis 70 @ 70
68 to 70 lb.....# 30¢ (dis 70 @ 70
70 to 72 lb.....# 30¢ (dis 70 @ 70
72 to 74 lb.....# 30¢ (dis 70 @ 70
74 to 76 lb.....# 30¢ (dis 70 @ 70
76 to 78 lb.....# 30¢ (dis 70 @ 70
78 to 80 lb.....# 30¢ (dis 70 @ 70
80 to 82 lb.....# 30¢ (dis 70 @ 70
82 to 84 lb.....# 30¢ (dis 70 @ 70
84 to 86 lb.....# 30¢ (dis 70 @ 70
86 to 88 lb.....# 30¢ (dis 70 @ 70
88 to 90 lb.....# 30¢ (dis 70 @ 70
90 to 92 lb.....# 30¢ (dis 70 @ 70
92 to 94 lb.....# 30¢ (dis 70 @ 70
94 to 96 lb.....# 30¢ (dis 70 @ 70
96 to 98 lb.....# 30¢ (dis 70 @ 70
98 to 100 lb.....# 30¢ (dis 70 @ 70

Hand Cuffs and Leg Irons.

Providence Tool Co., Hand Cuffs, \$15.00 # dos, dis 10¢
Providence Tool Co., Leg Irons, \$25.00 # dos, dis 10¢
Tower's.....dis 25
Daley's Improved Hand Cuffs: 2 Hands, Polished, # dos, \$48; Nickel, \$57; 3 Hands, Polished, # dos, \$72; Nickel, \$84.....dis 20

Handles.

Iron, Wrought or Cast.—

Door or Thumb.....dis 70
No.....dis 70
Per dos, \$0.90 1.00 1.15 1.35 1.50.....dis 60&10 @ 10
Rogert's Latches.....# dos, 30¢ @ 35¢
Bronze Iron Drop Latches.....# dos, 70¢ net
Jap'd Store Door Handles—Nuts, \$1.62; Plate, \$1.10;
no Plate, \$0.88.....net
Barn Door.....# dos, \$1.40, dis 10&10
Chest and Lifting.....dis 70

Handles, Wood.

Saw and Plane.....dis 40&10 @ 40&10&5
Hammer, Hatchet, Axe, Sledge, &c.....dis 35
Brad Axl.....# gross \$2.00
Hickory Firmer Chisel, assorted.....# gross, 4.50
Hickory Firmer Chisel, large.....# gross 5.00
Apple Firmer Chisel, assorted.....# gross 5.00
Apple Firmer Chisel, large.....# gross 6.00
Socket Firmer Chisel, assorted.....# gross 3.00
Socket Framing Chisel, assorted.....# gross 5.00
J. B. Smith Co.'s Pat. File.....dis 50
File, assorted.....# gross 2.75 (dis 40
Auger, assorted.....# gross 5.00 (dis 40
Auger, large.....# gross 7.00 (dis 40
Patent Auger, Ives.....dis 30&10
Patent Auger, Douglas.....set \$1.25 net
Patent Auger, Swan's.....set \$1.00 net
Hoe, Rake, Shovel, &c.....dis 50&10

Cross Cut Saw Handles.

Atkins' No. 1 Loop, # pair, 80¢ No. 3, 22¢; No. 2, and No. 4 Reversible, 22¢
Boynton's Loop Saw Handles.....50¢, dis 60
Champion.....dis 15

Hangers.

Barn Door, old patterns.....dis 60&10 @ 70
Barn Door, New England.....dis 60&10 @ 70
Samson Steel Anti-Friction.....dis 55
Orleans Steel.....dis 55
Hamilton Wrought Wood Track.....dis 55
U. S. Wood Track.....dis 65
Champion.....dis 60
Rider and Wooster, Medina Mfg. Co.'s list.....dis 70
Climax Anti-Friction.....dis 55
Climax Steel Anti-Friction.....dis 50
Zenith for Wood Track.....dis 55
Reed's Steel Arm.....dis 40
Challenge, Barn Door.....dis 50
Stering Improved (Anti-Friction).....dis 55
Victor, No. 1, \$15; No. 2, \$16.50; No. 3, \$18.....dis 50&5
Cheritree.....dis 50&10 @ 60
Kiddie's.....dis 50&10 @ 60
The "Boss".....dis 60

Best Anti-Friction.....dis 60
 Duplex (Wood Track).....dis 60
 Terry's Patent.....dis 60
 Cronk's Patent.....No. 4, \$12; No. 5, \$14.40; No. 6, \$18
 Wood Track Iron Clad.....dis 50
 Carrier Anti-Friction.....dis 50
 Architect.....dis 50
 Ellipse.....dis 50
 Felix.....dis 50
 Richards.....dis 50
 Lane's Steel Anti-Friction.....dis 50
 The Ball Bearing Door Hanger.....dis 50
 Warner's Patent.....dis 50
 Stearns' Anti-Friction.....dis 50
 Stearns' Challenge.....dis 50
 Faultless.....dis 50
 American.....dis 50
 Rider & Wood.....dis 50
 Paragon, Nos. 1, 2 and 3.....dis 50
 Paragon, Nos. 5, 6, 7 and 8.....dis 50
 Crescent.....dis 50
 Nickel Cast Iron.....dis 50
 Nickel, Malleable Iron and Steel.....dis 50

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1888.

Isaiah Blood.....dis 35
 Hunt's Shingling Lath and Claw.....dis 40
 Hunt's Broad.....dis 40
 Buffalo Hammer Co.....dis 40
 Burd's.....dis 40
 Yerkes & Plumb.....dis 40
 Wm. Mann, Jr., & Co.....dis 50
 Underhill Edge Tool Co.....dis 50
 Underhill's Haines and Bright goods.....dis 50
 C. Hammond & Son.....dis 50
 Simmons.....dis 50
 Peck's.....dis 50
 Kelly's.....dis 50
 Sargent & Co.....dis 50
 Ten Eyck Edge Tool Co.....dis 50
 Collins, following list.....dis 50
 Shingling, Nos. 1, 2, 3.....dis 50
 Claw, Nos. 1, 2, 3.....dis 50
 Lathing, Nos. 1, 2, 3.....dis 50

Hay Knives.

Lighting.....dis 50
 Electric.....dis 50
 Gen.....dis 50
 Wadsworth's.....dis 50
 Carter's Needle.....dis 50
 Heath's.....dis 50

Hinges.

Wrought Iron Hinges—
 Strap and T.....dis 50
 Screw Hook and Eye, 8, 10, 12 in.....dis 50
 Strap.....dis 50
 Heavy Wrought Hook.....dis 50
 Screw Hook and Eye.....dis 50
 Rolled Blind Hinges, Nos. 32 and 34.....dis 50
 Rolled Blind Hinges, Nos. 232 and 234.....dis 50
 Rolled Blind.....dis 50
 Rolled Raised.....dis 50
 Plate Hinges, 8, 10 & 12 in.....dis 50
 "Providence" over 12 in.....dis 50

Spring Hinges.

Geer's Spring and Blank Butts.....dis 50
 Union Spring Hinge Co.'s list, March, 1888.....dis 50
 Acme, Crown, Empire and U. S.....dis 50
 American, Gem, and Star, Japanned.....dis 50
 American, Gem, and Star, Bronzed.....dis 50
 Oxford, Bronze and Brass.....dis 50
 Barker's Double Acting.....dis 50
 Union Mfg. Co.....dis 50
 Bommer's.....dis 50
 Buckman's.....dis 50
 Chicago.....dis 50

Gate Hinges.

Western.....dis 50
 N. E. Reversible.....dis 50
 Clark's, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....dis 50
 Automatic.....dis 50
 Common Sense.....dis 50
 Seymour's.....dis 50
 Shepard's, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....dis 50
 Reed's Latch and Hinges.....dis 50

Blind Hinges.

Parker.....dis 50
 Palmer.....dis 50
 Seymour.....dis 50
 Nicholson.....dis 50
 Huffer.....dis 50
 Clark's, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....dis 50
 Clark's Mortise Gravity.....dis 50
 Sargent's, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....dis 50
 Reading's Gravity.....dis 50
 Shepard's "Noiseless" Nos. 50, 60, 65 & 66.....dis 50
 Shepard's Niagara Gravity, Nos. 1, 3 and 5.....dis 50
 Shepard's Buffalo Gravity, Nos. 1, 3 and 5.....dis 50
 Shepard's Champion Gravity No. 76.....dis 50
 Shepard's Steamboat Gravity, No. 10.....dis 50
 Shepard's Acme Lull & Porter.....dis 50
 Shepard's O. S. Lull & Porter.....dis 50
 Shepard's "Queen City" Reversible.....dis 50
 Clark's Lull & Porter, Nos. 9, 1, 13, 2, 24, 8.....dis 50
 North's Automatic Blind Pictures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....dis 50

Keys.

Handled—
 Garden, Mortar, &c.....dis 50
 Planter's, Cotton, &c.....dis 50
 Warren Hoe.....dis 50
 Magic.....dis 50

Eye.

D. & H. Scovill.....dis 15
 Lane's Crescent Scovill Pattern.....dis 45
 Lane's Crescent Planter's Pattern.....dis 45
 Lane's Razor Blade, Scovill Pattern.....dis 30
 Maynard, S. & O. Pat.....dis 45
 Sandusky Tool Co.....dis 60
 Hubbarl & Co.....dis 60
 Bare.....dis 60
 Grub.....dis 60

Hog Rings and Ringers.

Hill's Improved Ringers.....dis 50
 Hill's Old Style Ringers.....dis 50
 Hill's Tongues.....dis 50
 Hill's Rings.....dis 50
 Perfect Rings.....dis 50
 Perfect Ringers.....dis 50
 Blair's Box Rings.....dis 50
 Blair's Hog Rings.....dis 50

Champion Rings.....dis 50
 Champion Rings, Double.....dis 50
 Brown's Rings.....dis 50
 Brown's Rings.....dis 50

Holding Apparatus.

"Moore's" Hand Holst, with Lock Brake.....dis 15
 "Moore's" Differential Pulley Block.....dis 20

Holders, Tool.

Balz Pat.....dis 50

Hollow-Ware.

Iron—
 Stove Hollow-Ware, Ground.....dis 50
 Stove Hollow-Ware, Unground.....dis 50
 Enamelled and Tinned Hollow-Ware.....dis 50
 Oval Boilers, Saucepans & Gine Pots.....dis 50
 Gray Enamelled Ware.....dis 50
 Agate and Granite Ware.....dis 50
 Rustless Hollow-Ware.....dis 50
 Galvanized Tea Kettles.....dis 50
 Inch.....dis 50
 Each.....dis 50
 Silver Plated—
 Reed & Barton.....dis 50
 Meriden Britannia Co.....dis 50
 Simpson, Hall, Miller & Co.....dis 50
 Rogers & Brother.....dis 50
 Hartford Silver Plate Co.....dis 50
 William Rogers Mfg. Co.....dis 50

Hooks.

Bird Case, Sargent's list.....dis 50
 Bird Case, Reading.....dis 50
 Clothes Line, Sargent's list.....dis 50
 Clothes Line, Reading list.....dis 50
 Ceiling, Sargent's list.....dis 50
 Harness, Reading list.....dis 50
 Coat and Hat, Sargent's list.....dis 50
 Coat and Hat, Reading.....dis 50

Wrought Iron—

Cotton Pat.....dis 50
 Cotton Pat.....dis 50
 Tassel and Picture (T. & S. Mfg. Co.).....dis 50
 Wrought Staples, Hooks, &c.....dis 50
 Bench Hooks.....dis 50

Wire.

Wire Coat and Hat, Gem, list April, 1888.....dis 45
 Wire Coat and Hat, Miles, list April, 1889.....dis 45
 Indestructible Coat and Hat.....dis 45
 Belt.....dis 45
 Grass.....dis 45
 Rub.....dis 45
 Whitcomb Patent.....dis 45
 Hooks and Eyes—Malleable Iron.....dis 45
 Hooks and Eyes—Brass.....dis 45
 Fish Hooks, American.....dis 45

Horse Nails.

Nos. 6, 7, 8, 9, 10
 Ausable.....dis 50
 Clinton, Fin.....dis 50
 Essex.....dis 50
 Putnam.....dis 50
 Vulcan.....dis 50
 Northwest.....dis 50
 C. C.....dis 50
 A. C.....dis 50
 C. R. K.....dis 50
 Champlain.....dis 50
 New Haven.....dis 50
 Saratoga.....dis 50
 Champion.....dis 50
 Capwell.....dis 50
 Star.....dis 50

Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition.....dis 50
 Standard.....dis 50
 Extra.....dis 50
 N. Y. B. & P. Co., Para.....dis 50
 J. Y. B. & P. Co., Extra.....dis 50
 N. Y. B. & P. Co., Dundee.....dis 50

Ice Picks, Chisels, &c.

Am. Ice Chisel Fold.....dis 50
 National Ice Chisel.....dis 50
 Novelty Ice Breakers.....dis 50
 Dunlap's Ring Picks.....dis 50
 Wood Head Picks, Sargent's.....dis 50
 Iron Head Picks, Sargent's.....dis 50
 Ice Mallets, Pick in handle.....dis 50
 Ice Axes, Small Cast or Mail.....dis 50
 Combination Ice Tools.....dis 50
 Acme Ice Pick and Tongs.....dis 50
 Roger's Lightning Ice Chisel.....dis 50

Ice Tongs.

Champion, S. S. & Co.....dis 50

Jack Screws.—See Screws.

Kettles.....dis 50
 Brass, 7 to 17 in.....dis 50
 Brass larger than 17 inches.....dis 50
 Enamelled and Tea Kettles.....dis 50

Keys.

Lock Ass'n list Dec. 30, 1886.....dis 50
 Eagle, Cabinet, Trunk and Padlock.....dis 50
 Hotchkiss' Brass Blanks.....dis 50
 Hotchkiss' Copper and Tinned.....dis 50
 Hotchkiss' Padlock and Cabinet.....dis 50
 Hatchet Bed Keys.....dis 50

Knife Sharpeners.

Parkin's Applewood Handles.....dis 50
 Parkin's Rosewood or Cocobolo.....dis 50

Knives.

Wilson's Butcher Knives.....dis 50
 Ames' Butcher Knives.....dis 50
 Nichols' Butcher Knives.....dis 50
 Ames' Bread Knives.....dis 50
 Moran's Shoe and Bread Knives.....dis 50
 Hay and Straw.....dis 50
 Table and Pocket.....dis 50

Knobs.

Door Mineral.....dis 50
 Door Por. Jap.....dis 50
 Door Por. Por. Nickel.....dis 50
 Door Por. Plated, Nickel.....dis 50
 Drawer, Porcelain.....dis 50
 Hemlock Door Knobs, new list.....dis 50
 Yale & Towne Wood Knobs, list Dec., 1885.....dis 50
 Furniture Plain.....dis 50
 Furniture, Wood Screws.....dis 50
 Base, Rubber Tip.....dis 50
 Picture, Judd's.....dis 50
 Picture, Sargent's.....dis 50
 Picture, Hemlock.....dis 50
 Shutter, Porcelain.....dis 50
 Carriage, Japanned.....dis 50

Ladies—
 Melting, Sargent's.....dis 50
 Melting, Reading.....dis 50
 Melting, Monroe's Patens.....dis 50
 Melting, P. S. & W.....dis 50
 Melting, Warner's.....dis 50

Lanterns.

Rebular, No. 9, without Guards.....dis 50
 Rebular, Liftwire, No. 0, without Guards.....dis 50
 Rebular, Hinge Tip No. 0, without Guards.....dis 50
 Rebular, Bottom Lift, without Guards.....dis 50
 Rebular, U. S. Safety Lift Wire, no Guards.....dis 50
 Guards for Tubulars, Add \$7.25; Large, \$7.50.....dis 50
 Police, Small, \$5.00; Med, \$7.25; Large, \$7.50.....dis 50
 Porter's Tin & R.....dis 50

Lemon Squeezers.

Porcelain Lined, No. 1.....dis 50
 Wood, No. 2.....dis 50
 Wood, Common.....dis 50
 Dunlap's Improved.....dis 50
 Jammis.....dis 50
 Jennings' "Star".....dis 50
 The "Boss".....dis 50
 Dean's.....dis 50
 Little Giant.....dis 50
 King.....dis 50

Lines.

Cotton and Linen Fish, Draper's.....dis 50
 Draper's Chalk.....dis 50
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....dis 50
 Cotton Chalk.....dis 50
 Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50.....dis 50
 Silver Lake, Braided, Nos. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; No. 4, \$8.00; No. 5, \$8.50.....dis 50
 Mason's Linen, No. 3 1/2, \$1.50; No. 4, \$2; No. 4 1/2, \$2.50; No. 5, \$3.....dis 50
 Wire Clothes, No. 18, \$3.75; No. 19, \$3.25; No. 20, \$2.75.....dis 50
 Ventilator Cord, Samson Braided, White or Drab.....dis 50
 Cotton.....dis 50

Locks, Padlocks, Cabinet Locks, &c.

Door Locks, Latches, &c.—
 List, Dec. 30, '86, chgd Feb. 2, '87.....dis 50
 Note—Lower net prices often made
 Reading Hardware Co. (list Jan. 1, '88), dis 40
 Livingston & Co.....dis 50
 Perkins' Burglar Proof.....dis 50
 Plate.....dis 50
 F. Manly's "Extension Cylinder".....dis 50
 Barnes Mfg. Co.....dis 50
 Yale Corrugated Key.....dis 50
 Dietz Flat Key.....dis 50
 L. & C. Round Key Latches.....dis 50
 L. & C. Flat Key Latches.....dis 50
 Romer's Night Latches.....dis 50
 Yale new list.....dis 50
 "Shepardson" or "U. S.".....dis 50
 "Feltner" or "American".....dis 50
 Seed's N. Y. Hasp Lock.....dis 50

Cabinets.

"Eagle, Gaylord Parker and (list March, '84, revised Corbin, Jan. 1, '85, dis 35)
 Delta, Nos. 36 to 39.....dis 40
 Delta, Nos. 51 to 63.....dis 40
 Delta, Nos. 86 to 90.....dis 40
 Stoddard Lock Co.....dis 50
 Champion Night Latches.....dis 50
 Barnes Mfg. Co.....dis 50
 Eagle and Corbin Frank.....dis 50
 "Champion" Cabinet and Combination.....dis 50
 Yale.....dis 50
 Romer's.....dis 50

Padlocks.

List, Dec. 23, '84.....dis 50
 Yale Lock Mfg. Co. s.....dis 50
 Eagle.....dis 50
 Eureka, Eagle Lock Co.....dis 50
 Romer's, Nos. 0 to 91.....dis 50
 Romer's, Nos. 200 to 506.....dis 50
 A. E. Dietz.....dis 50
 "Champion" Padlocks.....dis 50
 Hotchkiss.....dis 50
 "Star".....dis 50
 "Horse Shoe".....dis 50
 Barnes Mfg. Co.....dis 50
 No. 1.....dis 50
 Brown's Patent.....dis 50
 Scandinavian.....dis 50
 Frain's Pat. Scandinavian, new list (low).....dis 50

Lumber Tools.

Ring Peavies, "Blue Line" Finish.....dis 50
 Ring Peavies, Common Finish.....dis 50
 Steel Socket Peavies.....dis 50
 Wall, Iron Socket Peavies.....dis 50
 Cant Hooks, "Blue Line" Finish.....dis 50
 Cant Hooks, Common Finish.....dis 50
 Cant Hooks, Mail, Socket Clasp, "Blue Line" Finish.....dis 50
 Cant Hooks, Mail, Socket Clasp, Common Finish.....dis 50
 Cant Hooks, Clip Clasp, "Blue Line" Fin.....dis 50
 Cant Hooks, Clip Clasp, Common Finish.....dis 50
 Grand Spikes.....dis 50
 Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft. 18 ft. 20 ft.....dis 50
 Pike Poles, Pike only.....dis 50
 Pike Poles not Ironed.....dis 50
 Setting Poles.....dis 50
 Warm Hooks.....dis 50
 Landing Hooks.....dis 50
 Skidding Tongues.....dis 50
 Log Binders.....dis 50
 Tended Root Calks, 1 to 5 M, dis 25; 5 to 10 M, dis 30
 Square Steel Root Calks.....dis 50
 Chain Rafting Dogs.....dis 50
 Chain Rafting Dogs.....dis 50
 Timber Grapples.....dis 50

Lastro.

Four-ounce Bottles.....dis 50

Mallets.

Hickory.....dis 50
 "Scumvite".....dis 50
 B. & L. Block Co. Hickory and L. V.....dis 50

Mattocks.—Regular list.

dis 50

Meat Cutters.

Dixon's—Nos. 1, 2, 3, 4.....dis 50
 Woodruff's.....dis 50
 Champion.....dis 50
 Hales' Pattern Nos. 11, 12, 13.....dis 50
 American.....dis 50
 Each.....dis 50
 Enterprise.....dis 50
 Nos. 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100.....dis 50

Crawford's Adjustable.....	dis 80
Ellrich's Socket and Ratchet.....	dis 25 @ 25&10
Allard's Spiral, new list.....	dis 25
Kolb's Common Sense.....	doz 16, dis 25&10

CURRENT METAL PRICES.

FEBRUARY 15, 1888.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
3/4 to 2 in. round and square...	2.10 @ 2.20¢
1 to 6 in. x 3/4 to 1 in.	
Refined Iron:	
3/4 to 2 in. round and square...	2.25 @ 2.40¢
1 to 4 in. x 3/4 to 1 1/2 in.	
4 1/2 to 6 in. x 3/4 to 1 in.	
1 to 6 in. x 1/2 and 5-16	2.45 @ 2.60¢
Rods—3/4 and 1-1/2 round and sq.	2.35 @ 2.50¢
Bands—1 to 6 x 3-16 to No. 12.	2.50 @ 2.60¢
"Burden's Best" Iron, base price	3.00 @ ...
Burden's "H. B. & S." Iron, base price	2.80 @ ...
"Ulster"	3.10 @ ...
Norway Rods	4.00 @ 5.00¢

Extras on Bar Iron.

Brown, Bonnell & Co., Youngstown, Ohio, issue under date of February 1, 1888, the following list of extras where the base price of Iron is 2 cents or less per pound. The advance is given in cents for each 100 pounds

Bar Iron.	Advance over bar sizes
R. R. Specification, Single Refined	
"B. B." Double Refined	\$0.20
"B. B." Extra, or Bridge Iron .....	.50

Regular Bar Sizes.

Rounds and Squares—1 to 1 1/2 inches. No adv.
Flats—1 1/2 to 4 x 3/4 to 1 inch. No adv.

Flat Bars

6 x 3/4 to 1 1/2 inches	\$0.30
7 x 3/4 to 1 1/2 inches .....	.30
4 1/2 to 6 x 3/4 to 1 inch. ....	.05
2 1/2 to 3 1/2 x 1 1/2 to 2 inches .....	.50
1 1/2 to 6 x 1 1/2 to 1 1/2 inches .....	.25
1 1/2 to 1 1/2 x 3/4 to 3/4 inch. ....	.05
1 to 1 1/2 x 3/4 to 3/4 inch. ....	.10
3/4 to 3/4 x 3/4 to 3/4 inch. ....	.20

Rounds and Squares.

4 1/2 to 5 inches	\$0.70
3 1/2 to 4 inches .....	.50
2 1/2 to 3 1/4 inches .....	.25
2 to 2 3/4 inches .....	.10
3/4 to 3/4 inch. ....	.05
3/4 to 7-16 inch. ....	.10
5-16 inch .....	.30
3/4 inch .....	.40
3/4 inch .....	.50

Heavy Bands.

7 to 8 x 1/4 and 5-16 inch	\$0.60
1 1/2 to 6 x 1/4 and 5-16 inch. ....	.10
1 to 1 1/2 x 1/4 and 5-16 inch. ....	.15
3/4 to 3/4 x 1/4 and 5-16 inch. ....	.25
1/2 and 3/4 x 1/4 and 5-16 inch. ....	.50

Light Bands.

1 1/2 to 6 x 1/4 and 3-16 inch. ....	.25
1 to 1 1/2 x 1/4 and 3-16 inch. ....	.35
3/4 x 1/2 to 3-16 inch. ....	.50
3/4 x 1/2 to 3-16 inch. ....	.70
6 to 6 x Nos. 11 and 12 .....	.25
1 1/2 to 2 1/2 x Nos. 11 and 12. ....	.35
1 to 1 1/2 x Nos. 11 and 12. ....	.45
3/4 x Nos. 11 and 12. ....	.60
3/4 x Nos. 11 and 12. ....	.90

Oval Iron.

2 1/2 to 1 1/2 inches	\$0.20
3/4 to 3/4 inch. ....	.30
1/2 inch .....	.40
3/4 inch .....	.60

Half Oval and Half Round.

2 inches	\$0.40
3/4 to 1 1/2 inches .....	.35
3/4 and 3/4 inch. ....	.60
1/2 inch .....	.75
3/4 inch	1.50
1/2 inch	2.50

Angle Iron.

1 1/2 to 3 inches	\$0.60
1 inch	1.00

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
10 to 16	2.75 @ 2.80¢	3.25 @ ...
17 to 20	2.85 @ 3.00¢	3.25 @ 3.50¢
21 to 24	3.00 @ 3.10¢	3.50 @ ...
25 and 26	3.20 @ ...	3.75 @ ...
27	3.75 @ 3.77 1/2¢	4.00 @ ...
28	3.50 @ ...	4.00 @ ...

	B. R. 2d qual.
Galvanized, 14 to 20	4.80¢ @ 4.90¢
Galvanized, 21 to 24	5.20¢ @ 5.30¢
Galvanized, 25 to 26	5.60¢ @ 5.75¢
Galvanized, 27	6.00¢ @ 6.08 1/2¢
Galvanized 28	6.40¢ @ 6.00¢
Patent Plinished	10¢ @ 10¢
Russia	9 1/4¢ @ 10¢
American Cold Rolled B. B.	5¢ @ 7¢

STEEL.—Duty. Ingots, Bars, Sheets, &c., valued at 4¢ per lb or less, 45¢ ad val.; valued above 4¢ and not above 7¢ per lb, 2¢ per lb; valued above 7¢ and not above 10¢ per lb, 2 1/2¢ per lb; valued above 10¢ per lb, 3 1/4¢ per lb. Extras—Steel Bars, Rods, &c., cold hammered or polished in any way in addition to ordinary hot rolling, 1 1/4¢ per lb in addition to above; Steel Circular Saw Plates, 1¢ per lb in addition to the above.

Chrome Steel.

Tool Steel, ordinary sizes 3/4 to 3 inches. net.
Adamantine Shoes and Dies.
Magnet Steel.

English Steel from Store.

Best Cast	14 1/2 @ 15¢
Extra Cast	16 1/2 @ 17¢
Swaged Cast	16 @ 16¢
Best Double Shear	15 @ 15¢
Blister, 1st quality	12 1/2 @ 10¢
German Steel, best	9 @ 9¢
2d quality	8 @ 8¢
3d quality	15 @ 15¢
Sheet Cast Steel, 1st quality	14 @ 14¢
2d quality	13 1/2 @ 13 1/2¢
3d quality	13 1/2 @ 13 1/2¢

METALS.

Tin.

Banca, Pigs	38 @ 38 1/2¢
Straits, Pigs	38 @ 38 1/2¢
English, Pigs	37 1/2 @ 37 1/2¢
Straits in Bars	39 @ 40¢

Tin Plates.

Charcoal Plates.—Bright.	Per box.
Melyn Grade.	
IC, 10 x 14	\$6.50
IC, 12 x 12	6.75
IC, 14 x 20	6.50
IC, 20 x 28	13.00
IX, 10 x 14	8.00
IX, 12 x 12	8.25
IX, 14 x 20	8.00
IX, 20 x 28	16.00
DC, 12 1/2 x 17	6.00
DX, 12 1/2 x 17	7.50
Calland Grade.	
IC, 10 x 14	6.25
IC, 12 x 12	6.00
IX, 10 x 14	7.50
IX, 12 x 12	7.75
IX, 14 x 20	7.50
Allaway Grade.	
IC, 10 x 14	\$5.25 @ 5.50
IC, 12 x 12	5.50 @ 5.75
IC, 14 x 20	5.25 @ 5.50
IC, 20 x 28	10.75 @ 11.00
IX, 10 x 14	6.50 @ 6.75
IX, 12 x 12	6.75 @ 7.00
IX, 14 x 20	6.50 @ 6.75
IX, 20 x 28	12.75 @ 13.00
DC, 12 1/2 x 17	5.00 @ 5.25
DX, 12 1/2 x 17	6.00 @ 6.25

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20	\$4.90 @ \$5.10
10 x 20	7.50 @ 8.00
20 x 28	10.00 @ 10.25
IX, 10 x 14, 14 x 20	6.00
RV Grade.—IC, 10 x 14, 14 x 20	4.90 @ 5.00

Charcoal Plates.—Tenne.

Dean Grade.—IC, 14 x 20	\$4.75
20 x 28	\$9.25 @ 9.50
IX, 14 x 20	5.75
20 x 28	11.50
Abecarne Grade.—IC, 14 x 20	\$4.50 @ 4.65
20 x 28	9.00 @ 9.25
IX, 14 x 20	5.50 @ 5.75
20 x 28	11.00

Tin Boiler Plates.

	Per pound.
IXX, 14 x 26	112 sheets. 6 1/2¢
IXX, 14 x 28	112 sheets. 6 1/2¢
IXX, 14 x 31	112 sheets. 6 1/2¢

Copper.

Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 45¢ ad valorem.

Ingot.

Lake	17.50¢ @ 18¢
"Anchor" Brand	16.50¢ @ 17¢

Sheet and Bolt

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887.

Not wider than	Not longer than	And longer than	Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30—72	25	25	25	25	25	25	25	25	31	33
30—72	25	25	25	25	25	25	25	25	30	34
30—96	25	25	25	25	25	25	25	25	33	36
30—96	25	25	25	25	25	25	25	25	34	38
48—96	25	25	25	25	25	25	25	25	31	35
48—96	25	25	25	25	25	25	25	25	32	36
60—96	25	25	25	25	25	25	25	25	32	37
60—96	25	25	25	25	25	25	25	25	33	38
84—96	25	25	25	25	25	25	25	25	33	38
84—96	25	25	25	25	25	25	25	25	34	39
Over 84 in. wide	30	30	30	30	30	30	30	30	34	39

All Bath Tub Sheets. 16 oz. 14 oz. 12 oz. 10 oz.
Per pound. \$0.28 0.30 0.32 0.35
Bolt Copper, 3/4 inch diameter and over, per pound. 25¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 60 inches diameter, up to 96 inches diameter inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Flat Iron Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

14 ounce to square foot and heavier 28¢ || 12 ounce and up to 14 ounce to square foot | 29¢ |
| 10 ounce and up to 12 ounce | 31¢ |

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Brass and Copper Tubes.

Seamless Copper.	Seamless Brass.
3/8 inch	45¢
1/2 inch	41¢
3/4 inch	39¢
1 inch	37¢
1 1/4 inch	36¢
1 1/2 inch	34¢
2 inch	31¢

Roll and Sheet Brass.

Discount from list. 10 @ 15¢

Spelter.

Duty: Pig, Bars and Plates, \$1.50 per 100 lb.
Western Spelter. 5 1/2¢ @ 6¢
"Bergenport" 8 1/2¢ || "Bertha" | 7 1/4 @ 8¢ |

Zinc.

Duty: Sheet, 2 1/2¢ per lb.
600 lb casks 6 1/2¢ || Per lb | 7 @ 7 1/2¢ |

Lead.

Duty: Pig, \$2 per 100 lb. Old Lead 2¢ per lb. Pipe and Sheets, 3¢ per lb.
American 5 1/4¢ || Newark | 5 1/4¢ |
Bar	5 1/4¢
Pipe	7 1/2¢, dis 20¢
Tin-Lined Pipe	15¢, dis 20¢
Block Tin Pipes	55¢, dis 20¢
Sheet	8 1/4¢, dis 20¢

Solder.

1/2 @ 1¢ (Guaranteed) 24¢ || Extra Wiping | 20¢ |

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson 13¢ || Hallett's | 13¢ |

FRENCH GLASS.

January 20, 1887.—Per Box 50 feet.

Sizes.	Single.			
	1st.	2d.	3d.	4th.
	EFH	IEH	HH	HB
25 6 x 8 to 10 x 15	\$10.50	\$9.00	\$8.50	\$8.00
40 11 x 14 to 16 x 24	11.50	10.75	10.25	9.75
50 18 x 22 to 30 x 30	15.50	14.00	13.00	12.50
54 15 x 36 to 24 x 30	16.50	15.00	14.50	14.00
60 26 x 28 to 24 x 36	17.75	16.25	14.75	14.25
70 26 x 36 to 26 x 44	19.00	17.50	15.25	14.75
80 26 x 46 to 20 x 50	21.00	19.50	17.00	16.50
84 30 x 52 to 30 x 54	22.00	20.25	18.00	17.50
90 30 x 54 to 34 x 56	23.00	21.25	19.00	18.50
94 34 x 58 to 34 x 60	24.00	22.75	21.00	20.50
100 36 x 60 to 40 x 60	26.50	24.50	23.00	22.50

Sizes.	Double.			
	1st.	2d.	3d.	4th.
	EFH	IEH	HH	HB
25 6 x 8 to 10 x 15	\$13.00	\$12.50	\$12.00	\$11.50
40 11 x 14 to 16 x 24	16.00	15.00	14.50	14.00
50 18 x 22 to 30 x 30	20.50	19.50	18.50	18.00
54 15 x 36 to 24 x 30	22.00	20.75	19.50	19.00
60 26 x 28 to 24 x 36	25.00	23.00	21.50	21.00
70 26 x 36 to 26 x 44	26.00	25.00	23.00	22.50
80 26 x 46 to 20 x 50	28.00	26.50	24.50	24.00
84 30 x 52 to 30 x 54	30.00	28.00	26.00	25.50
90 30 x 54 to 34 x 56	31.00	30.00	28.00	27.50
94 34 x 58 to 34 x 60	32.50	31.00	29.00	28.50
100 36 x 60 to 40 x 60	36.00	32.50	32.00	31.50

Size above—\$15 per box extra for every 5 inches Discount—70 & 10 & 5¢.

AMERICAN GLASS.

No Change.

Oils.

Bleached Whale, per gal 42¢ || Bleached Sperm, per gal | 45 @ 78¢ |
| Fish Oil, Pressed | 27¢ |
| Lard, Prime, present make | 68 @ |